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ON CHANNEL

WE WONDER WHY NO-ONE WAS TOLD?

We realise that DoTaC moves in mysterious ways its wonders to perform but if for no other reason that simple courtesy it would be nice if it would tell the people who pay DoTaCs' salaries (well part of it anyway) when they're about to change a long existing system.

The system referred to is the way callsigns are assigned.

Since the legal introduction of CB in Australia, callsigns have consisted of three letters followed by three numbers, however, that is no longer the case.

As of 14 February this year, **new - repeat NEW** - licences will be issued on the basis of a prefix consisting of two letters commencing VH following by one or two letters indicating the state and a three numeral suffix. As an example, a new Victorian CB licence could read VHV 123 while Western Australia might be VHWA 123 or NSW VHNS 999. This move was made following an indication from Geneva that Australia was not following correct international procedure in the allocating of CB callsigns. When contaced by CBA, the DoTaC spokesperson stressed that this applied only to new licences and existing callsigns will remain unaffected. It was also stressed that if a new callsign was allocated in error to an existing licence-holder the matter should be brought to the attention of the regulatory authority who would then correct the mistake.

One thing which I predict will cause some problems is that the allocation of the first two letters runs from VH to VZ, that is, once all the possible suffix variations on VH have been used it will move to VI and eventually through to VZ. In the middle of that, however, is VK - the international prefix for Australian amateur stations - which is followed by a numeral indicating the state and two or three letters, two of which are specific to the actual operator.

My amateur callsign is VK3NLS which indicates that it is an Australian station, located in Victoria (3 is the Victorian numeral) while the N indicates Novice and the LS identifies the operator.

It's sure going to be interesting when CBers using the VK prefix start appearing! I personally believe that both a national and state 'identifier' are a good thing, but, I seriously question whether it is a good thing to use the VK prefix as I feel it is likely to cause friction between CBers and amateurs if for no other reason than it will give both sides something to actually argue about.

Realistically, while the prefixes might bear some similarity, the use of letters in the amateur suffix as against numerals in the CBers should provide ample difference - we'll wait and see.

APOLOGY

Rod Fewster has asked me to apologise for his missing 'Spectrum Anarchy' column. It will be missing for the next three issues due to some personal problems, however, his business South Pacific Radio continues to operate as usual.

NOVICE QUESTION/ANSWER SECTION ?

If there is sufficient interest, we will start running a Novice question/answer section (based on what you will encounter in the actual examination) in our next issue. Drop us a line and tell us your thoughts on the suggestion.

CB Action

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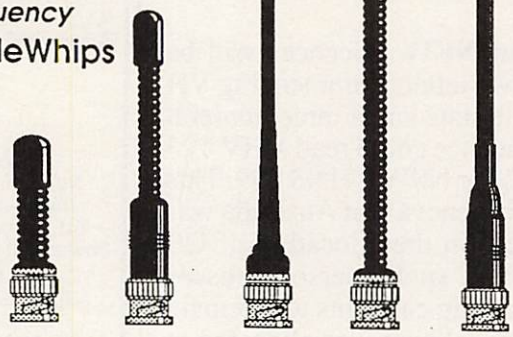

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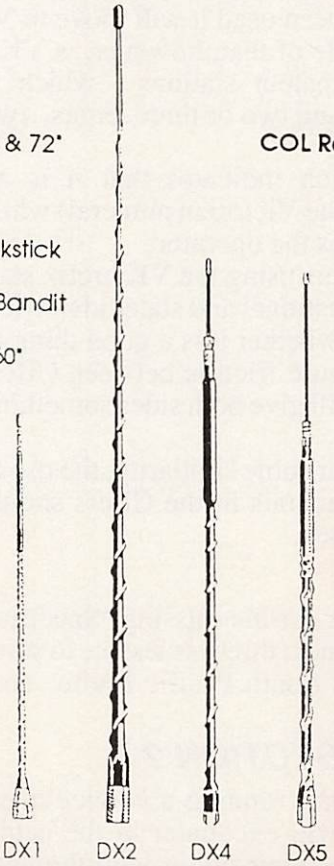

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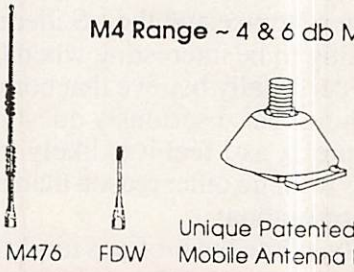

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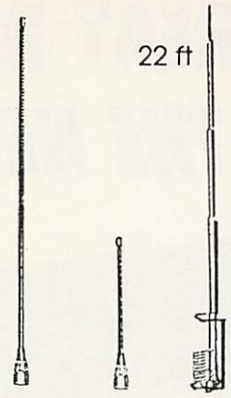

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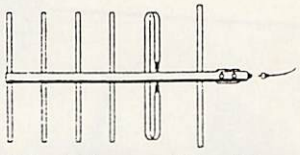

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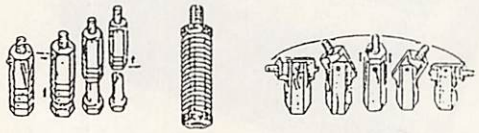

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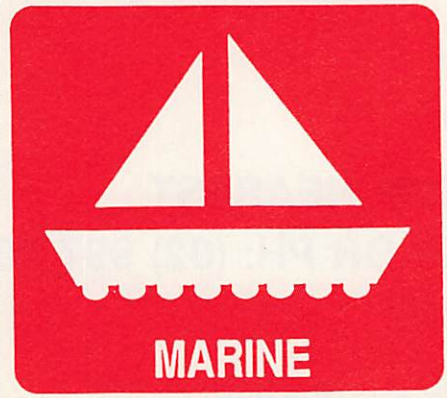

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What A Night That Was!

The Great New Year's Bush Bash!

Compared to previous New Year's Eve celebrations in Sydney, 31 December, 1991, was a relatively quiet night for revellers.

But for scanner enthusiasts it was one hell of a party. Between the annual celebrations and the arrival of President Bush, hobbyists had packed their scanners to the limit with every conceivable frequency to monitor.

With my wife in hospital with our newborn daughter, I decided to make the most of the evening scanner-wise.

I had both scanners fired up and dinner became a quick pizza in the radio room - it was "all systems go" for that last night of the year.

Planning to monitor a VIP visit or any special event takes a lot more than just tuning in on your scanner or HF receiver.

Before you even hit the "on" button you'll want to have done some basic research into the movements of your "target" and have thought about the frequencies likely to be active at various stages of the tour.

So before we get into the action, let me take you back to a few weeks before the great "Bush bash" began...

Plan Early

I began my plans to monitor the Bush visit when I first knew that his trip was definitely on the agenda.

His visit Down Under had been on the cards for some time, so I had kept an eye on the computer BBS network's international shortwave echo and slowly built what I consider to be a comprehensive list of known US Secret Service channels.

Although it had been 25 years since the last official visit by a US President, the same logistics and planning had been needed for recent visits by Vice President Quayle and other US VIPs, so I kept my frequency "hit lists" up to date on my computer, tuned it at each visit and stored away the information until the time was right.

Several weeks before Air Force One (the US Presidential jet) touched down at Sydney's Kingsford-Smith Airport, an advance team of Secret Service agents had come to Australia and made their preparations. A complete schedule was drawn up for the trip, along with any number of contingency plans, and all had to be checked, re-checked and "field tested".

The various routes to be taken by the presidential convoy had been planned in special joint meetings and briefing sessions with "OOO" personnel (representatives from the police, ambulance and fire brigades).

Several of our own government security services also played their part in insuring that nothing could go wrong.

Hot on the trail of anything that drops a carrier, CBA's Rob Williams slips undercover to lift the lid on US President Bush's Sydney stop-over. Learn how to monitor VIP visits in your city and discover why those men in trench coats and sunglasses were wandering around Sydney talking into their wristwatches!

A day before AF1's arrival, a US Air Force C5 Galaxy landed at Sydney to deliver the Presidential helicopter and several bullet-proof cars for the motorcade, together with several tonnes of communications equipment.

The Secret Service took delivery of their own black armored Chevrolet van, equipped with enough RF power to communicate with anyone they chose to. The media was instructed not to ask questions about the van, even though it stood out like a sore thumb.

Security personnel also re-screened Double Bay, where the President was to stay, looking for bugs, bombs and suspicious parcels.

While all this was happening, an operation of similar magnitude was in progress with the media.

Landline phones, fax machines, cellular phones, radio and TV equipment were all being installed for the use of visiting journalists as well as the local hacks.

Regular media two-way channels were active with the latest news of the tour as well as the occasional "happy New Year" cheerio to staff stuck back at the office.

Needless to say, every single media representative had undergone a thorough security check months prior to the visit.

Bush Flies In

On the other side of the world, President Bush and his entourage had already boarded the Boeing 747 designated "Air Force 1", a specially modified Jumbo estimated to cost American taxpayers over $US40,000 per hour.

AF1 is a fully equipped military command post, which in the event of a war can be put into the air at literally minutes' notice, so it has to be equipped with the latest and the ultimate in communications along with a "war room" and full living quarters for the President and his First Lady.

Following AF1 was a second 747, leased from TWA and carrying nearly 100 presidential staffers including aides, bureaucrats and diplomats. In the event of any operational problems with AF1 their Jumbo would be co-opted as the President's jet.

But why stop at two 747s? A third Jumbo was also signed up, this one with 200 US journalists ready to report even the most minute event involving the President.

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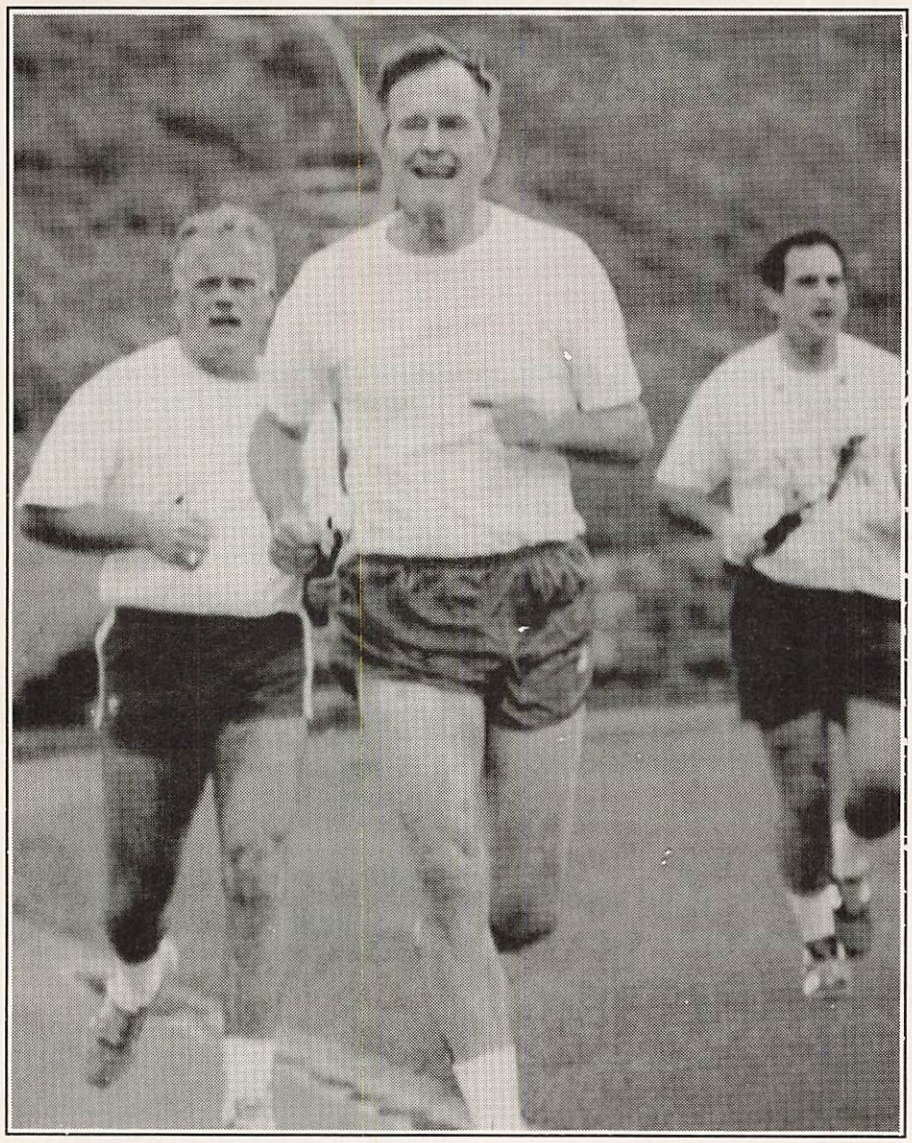


No, those runners accompanying President Bush are not there for the good of their health - they're there for the health of the President. Both are clutching handhelds and you can bet that some heavy weaponry is not all that far away.

The long haul from Washington DC to Australia gave several opportunities for HF utility DXers around the world to follow the journey. Standard international air route frequencies were used to inform air traffic controllers of AF1's progress, with 8867 kHz giving Australian DXers their opportunity to log AF1 (although we are told they don't QSL!).

Once over land, AF1 comms switched across to the VHF/UHF airband and many Sydney scanner enthusiasts were tuned in when the three 747s reported on approach to Sydney air traffic control. I also kept an ear on the 200-300 MHz FleetSatCom channels, where several monitoring buffs have copied and even taped traffic from AF1.

Nothing was heard this time, but it does pay to be prepared - who knows what you might "scoop"?

Down at ground level it was a scanners' delight. Qantas security staff were scattered all over the base, and were heard on 464.025 checking out suspect garbage bins and open windows.

Joining them were the Australian Protective Services and Federal Police.

Air Force One touched down at the Qantas Jet Base at 2000 local and was met by the Prime Minister, the Governor-General and the Governor and Premier of NSW.

Upon arrival well dressed men, wearing dark sunglasses with earphones on began talking into their watches.

Of course officials at the American Embassy in Canberra would not reveal how many security officers were involved in the tour but I'm sure that while this was all going on other teams were busy in Canberra, Melbourne, Singapore, Korea and Japan preparing for his arrival.

This is where the fun started. On previous visits to Australia certain channels used by one of the city's largest taxi cab fleets were suddenly swamped with secret service traffic.

I'm led to believe that soon after it was made aware to them what had happened the taxi company was told to vacate the channel and not divulge anything heard.

This time better planning prevented a similar incident.

While DVP (Digital Voice Protection) was only heard on two channels, 166.5125 and 164.8875, it was revealed to me that some low band VHF circuits were used together with 800 MHz.

Some callsigns reported as being heard were "roadrunner" and "halfback".

I'll leave it up to your imagination as to who was what. I'm sure that if the President was with us longer we would have found other exotic channels in use.

That night would have been one of our best opportunities to find ASIO channels.

Knowing full well they would be scrambled doesn't deter us from finding them, so with both scanners on the go I did my best to hunt them down.

Oh well, better luck next time, I know they are there somewhere.

OzRadio - The Monitor's Secret Weapon

Our "secret weapon" in keeping tabs on all this was the OzRadio forum carried on Sydney's Shortwave Possums computer BBS. Alex Wellner, Richard Jary, John Walker and SWP sysop Patrick McDonald were among the many Sydney scanner users who daily and sometimes hourly logged onto SWP with the latest frequencies, callsigns and other details of the traffic heard.

Without SWP we all would have been working on our own, often chasing up the same leads and the same deadends.

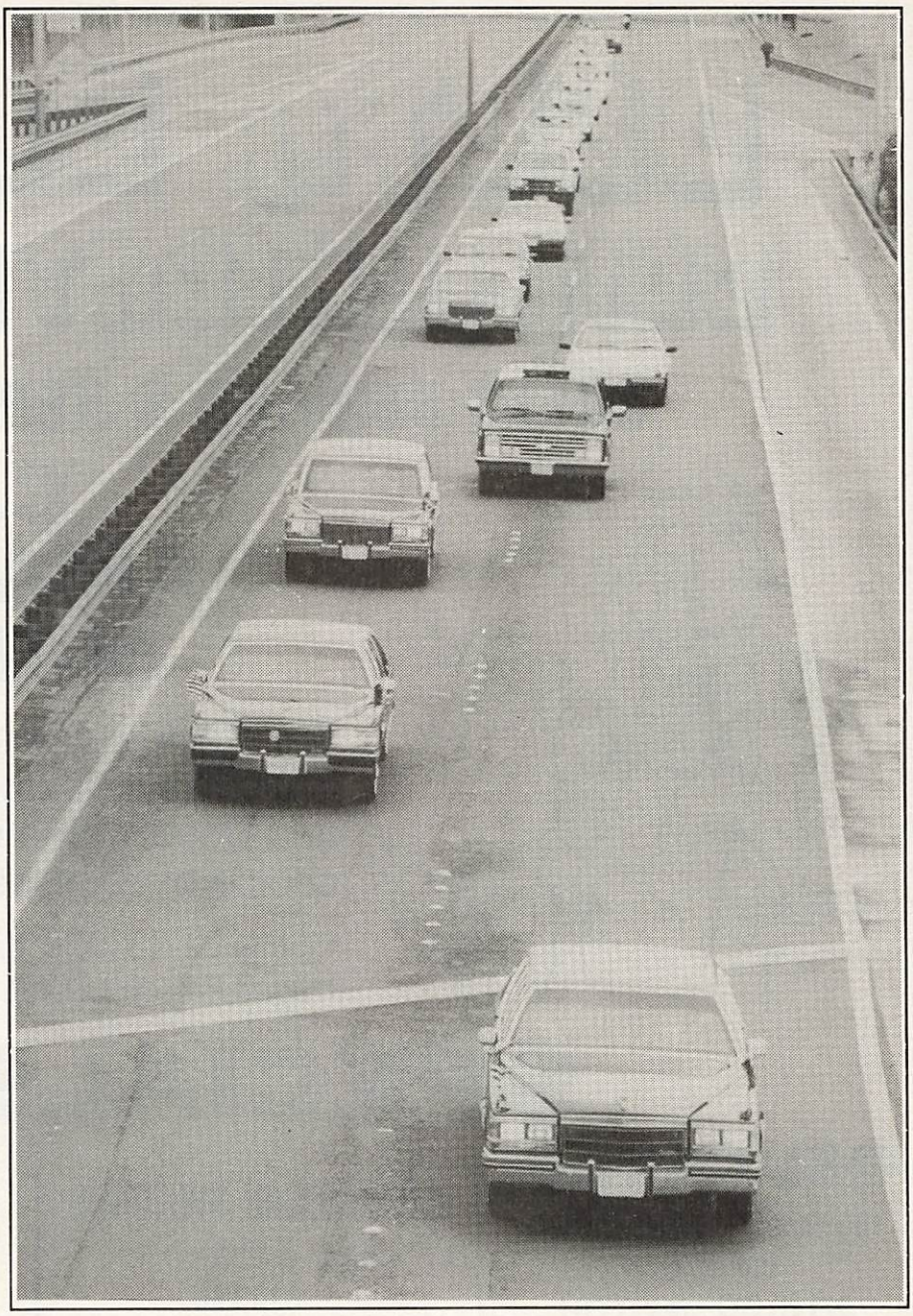
But OzRadio let us share the information and resulted in far more loggings made than otherwise.

I started with the NSW Police channels for the airport and eastern suburbs (VKG channel 28, 468.525 MHz), as well as the Sydney city metro channel 23 (468.400) and special operations channels 26 (468.475), 38 (468.775) and 52 (469.125).

VKG used channel 52 to supervise the blocking off of streets and halting regular traffic while the Presidential motorcade went by, even stopping traffic on the Harbour Bridge when Bush crossed later during his trip.

Traffic co-ordination was carried out via the Brisbane Street control room, using the video cameras which are strategically placed around Sydney to monitor peak hour traffic.

Channels 26 and 38 were less active and seemed to be used more for the New



When the President travels he really travels! Had you done your homework, however, you could have listened to some of the action (or lack of it).

Year's Eve celebrations - but more on that later.

The water police were active on their regular spot of ch 49, 469.050, keeping spectators and protesters (led by the familiar Greenpeace inflatables) well away from the Presidential boat.

The Naval Police also kept up regular patrols of Garden Island and maritime security while Bush was on the harbour.

All This And New Year's Eve

As if all this wasn't enough to monitor, there were the usual New Year's Eve celebrations across Sydney - traditionally one of the busiest times of the year for VKG.

With over 350 police mixed in with revellers, residents were assured that it would be safe to venture outside to watch the fireworks.

The transit Police, now an integral unit with the NSW Police force, were also busy at Sydney and North Sydney railway stations controlling drunks and brawls.

Mounted police, rescue squads, dog squads and highway units were also brought in to assist in crowd control.

Two areas in Sydney, Kings Cross and Darling Harbour, had been declared alcohol-free zones allowing police to search suspects as they arrived in the area.

Darling Harbour, with its own security staff, provided added security to protect property and visitors to the site.

Wet weather during the day and into the night reduced the size of the expected crowds at the major advantage points around Sydney harbour but those that did venture out were more than pleased with the spectacular fireworks display.

The next day the Presidential party went on a tour of our new National Maritime Museum at Darling Harbour.

Once again everyone turned out, the men with their funny wristwatches, local police, AFP and local security people.

Polair and the water Police were providing back-up support from the water as well as the air.

Throughout the operation Police were very cautious about mentioning details of the route or the alternative route, aware of people listening to them on scanners.

At 1500 local time AF1 was scheduled to leave Mascot for Canberra.

Minutes before the scheduled departure Mascot was closed to air traffic.

Jumbo jets were put in holding patterns around Sydney and domestic jets were told to reduce their air speed.

Scanners were alive with traffic as airlines reported in on their company channels of pending delays to their arrival in Sydney.

You can guess how much it would have cost putting these planes on hold!

I'd be interested to hear from DXers and scanner enthusiasts if they were able to follow the Presidential tour around Canberra and Melbourne.

Melbourne would be particularly interesting as security lines were breached forcing VKC to admit that they were unprepared for what happened.

From Melbourne AF1 flew to Singapore, and another chance to monitor the flight on HF channels that link the airline corridors between Darwin and Singapore.

After Singapore it was off to Korea and finally Japan before returning back home. While the days of aeronautical HF comms are numbered the President's plane still relies on it for air traffic control.

As you can see it was a busy night, but one that was successfully monitored.

The key elements to our success were forward planning and access to other scanner enthusiasts via the SWP BBS.

This enabled us to piece together parts from a jigsaw puzzle sufficiently enough to enjoy the hobby to it fullest.

The moral of the story, if indeed there is one, is to do your homework well prior to the day you intend to use it. The information gathered during this visit might well still be current next time around.

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online

by Patrick McDonald

ALL ABOUT COMMUNICATION RELATED COMPUTER PROGRAMS

Boy, what it is to be popular! The last couple of times the ever-illustrious CB ACTION has hit the nation's streets and newsagencies, all you rampaging computer owners immediately dialled me up on your shiny new modems ... and nearly blew the circuits on SHORTWAVE POSSUMS BBS! Guess that since computer usage among bonafide radio nuts is obviously on the increase, I'll have to do a comprehensive grease 'n oil change on the ole 'lectronic communications equipment at least once every two months. OK, now ... where shall we commence vis-a-vis computers and radios?

New Scanning BBS For Melbourne

Calling all Melburnians, there's excellent news for y'all regarding radio-related computer bulletin boards! The new *SPECTRUM BBS is now underway 24 hours daily on (03) 819-9167.* Sysop Michael Evans is a specialist in Australian scanner frequencies and, as you might expect, this is SPECTRUM's strong point: you can find online there just about any VHF/UHF frequency your little heart desires.

And if you can't, sysop Michael will gladly look it up for you in his massive frequency database. In fact, he'll even answer voice inquires on his mobile from those of you who are unfortunately still modem-less, on 018-348-421 (reasonable hours only, please). SPECTRUM will, in due course, carry all the radio-related files and info currently available on SWP BBS and will also pick up the popular Shortwave Echo (international) and OzRadio Forum (national) radio listeners' echomail message conferences from FidoNet.

This will save STD phone charges for some non-Sydney radio enthusiasts and also ease the congestion on SWP's overworked single phone line.

Satellite Tracking

TRAKSAT (TRK270.ZIP), mentioned in the last ONLINE column , seemed to attract a lot of attention, judging from the number of electronic modem "downloads" that rapidly occurred.

So I imagine some of you Sputnik peepers may also like to check out yet another tracker, by the name of **INSTANT TRACK.** It's online at SWP BBS under the filename **"IT-1-3.ZIP"** and is described by its US author as "designed to assist amateur radio operators who need to track a large number of earth-orbiting satellites, point antennas at them in real time, [and] estimate when communications links will be possible with operators in other parts of the world".

It has some nice general features: fairly good speed of operation, online help screens, relatively high ease-of-use, fully automatic finding of 200 "standard satellites" visible from your location, and really super-duper VGA sky maps which show all satellites against the background of the local heavens.

More esoteric IT capabilities abound. For example, you can compute "satellite co-visibility" which shows you when satellites can see other satellites (ie, when crosslinks are possible), and when satellites are in eclipse (in the shadow of the earth). This kind of display updates in real time, so you can actually see crosslinks appear and disappear. Very entertaining as well as useful!

Or, how about "satellite offpointing" (sometimes called the "squint angle")? **INSTANT TRACK** computes the angle by which the satellite's antennas are pointed away from you. This can explain why quality of communications via satellites such as Oscar-10 and Oscar-13 (spin-stabilised amateur radio satellites with directional antennas) varies from time to time. IT's graphics also show you where a satellite's antennas are pointing. Maps then display a contour line of the squint angle. Stations within this line have low squint, and can establish the best links via such satellites.

There are really too many other IT features to mention here in any detail: the ability to show the path loss between your station and the relevant satellite in real time, the capability to display the next three weeks' schedule for a satellite (or one day's schedule for 20 satellites), a handy-dandy background mode which permits you to track satellites and point antennas in real-time while you run other programs, rise-time finding (when the satellite rises over the local horizon) and even predictions of the movements of the old-fashioned sun and moon.

All in all, it's a pretty attractive program, and has been intensively tested for bugs for some months before its release. There are only two things you must do to get started: set your local time zone, and then enter your latest station elements.

These latter are the familiar NASA satellite element files needed for **TRAKSAT** and always available at SWP BBS. You then run one of the following two programs: IT, if your computer has an 8087 or 80287 co-processor; or ITNCP, if your computer doesn't have this fancy hardware fitted.

Naturally, the use of a numeric co-processor in your computer really speeds calculations up quite a bit in such mathematically orientated software. And note that while IT cheerfully displays text in lowly CGA or EGA video modes, you can only make use of the sophisticated satellite/star map feature if you have a VGA screen. Otherwise, IT will happily run on any IBM-compatible PC with at least 512k of memory. Due to the large file sizes involved, a hard disk is strongly advised.

Software For Your Scanner

Now for something completely different. Well-known US computer/radio enthusiast Bill Cheek reports via the SHORTWAVE computer BBS echomail conference that a new computer hardware interface is now available for the ever-popular PRO 2004/2005/2006 series of scanners. This little unnamed beauty (which I haven't seen or tested myself) is supposed to function with any computer that has a RS-232 type serial port.

Four modes of interface operation are apparently available: downloading 1 to 400 frequencies at a time from the computer into the scanner; uploading from the scanner those records of active frequencies from either SCAN or SEARCH operation modes to the computer's buffer memory, which you can then transfer to a database; quickly uploading the contents of the scanner's memory, 1 to 400 channels, into the computer's buffer memory, which can also be transferred to an appropriate database; and manually changing the scanner channels to be monitored, from the keyboard. Note that programming the scanner via the interface is similar to sending an ASCII file to a BBS via your modem.

This computer-scanner interface is sold only as a do-it-yourself kit, excluding cable and wiring. It reportedly requires around two hours to assemble the PCB with its six IC chips and handful of parts, and another three to six hours to install in your scanner. Yet another hour or so may be necessary to fabricate the cable that connects the computer and scanner interface. So this looks like a project for the more experienced electronic hobbyist. As I said, I haven't seen this thingy myself, but I completely trust Bill Cheek's info, and it certainly does look like a nifty way to program lots of scanner memory channels very quickly and, alternatively, to store found channels in a computer database.

(continued on page 15...)

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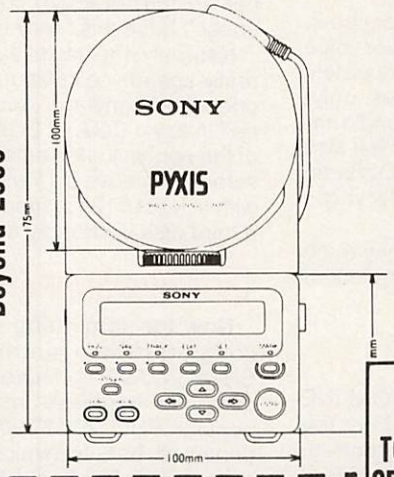

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by Patrick McDonald

ALL ABOUT COMMUNICATION RELATED COMPUTER PROGRAMS continued...

(And now, finally, the nitty gritty ... the nameless computer-canner interface kit for the PRO 2004/2005/2006 is available r US $99 from RW Systems, PO Box 910043 San Diego, CA 2191, USA. No phone number was given, but Telecom might elp you out here if you want to do a quick voice inquiry with RW ystems about shipment to Australia and other details.

Ionospheric Prediction Program

One final new radio software package to report on for this sue: the updated TMUF shortwave (HF) ionospheric propaga-on predictor from US ham James Harrison, W4HSR, deep in e heart of Texas.

This program is a Turbo Pascal language version (for IBM ompatible computers) of the famous **1982 MINIMUF** program. addition to calculating and displaying the Maximum Useable requency (MUF) and the Optimum Working Frequency (OWF), **MUF** permits you to easily choose and change the date and ux value for the calculation, to select transmit and receive tations from a database which you can control and customise, nd to plot the calculated values graphically if you have a color raphics adaptor, basic CGA video capability.

You may add stations to the supplied database using the rogram or, alternatively, employ any ASCII text editor to add to, odify, or rearrange the **TMUF** database.

The value of the current solar flux (related to the sunspot umber) is required, of course, for an accurate ionospheric rediction as to how hard Radio Botswana is going to hit your ipole, and this useful info is broadcast to the world absolutely ratis by the US-based National Bureau of Standards radio tations WWV (from Colorado) and WWVH (from Hawaii) at 18 inutes after each hour, 24 hours daily, on the parallel frequen-ies of 2.5, 5, 10, 15 and 20 MHz. (By the way, this service is an xcellent way to avoid paying Telecom to find out what time it !)

Anyhow, **TMUF** is easy to use, even self-explanatory, and eatures a "Lotus 123"-style menu for all selections.

You need only enter your own location, that of the station you ant to receive, the current value of the solar flux, then bop a ey and Robert is your Mum's brother!

Could be very useful in tracking down the best times to go for ose hard-to-hear DX catches and is a heck of a lot of fun to lay around with as well.

You may even find you learn a lot about the basics of HF ropagation. More could be said, but ink and paper are limited n this jam-packed mag, so I'll leave it at that. Like IT-1-3.ZIP, **MUF.ZIP** can be found and downloaded via modem at SWP BS, the address of which follows later in ONLINE.

Note that IT is shareware, which means that prospective users re allowed to try it out for free, and only need to buy it if they lan to use it regularly. **TMUF** is 'freeware'. The author ap-reciates any small donations, but these are not mandatory.

A Bit About A BBS

Let's now conclude by talking a little bit about computer bulletin board operating procedures, something you're going to have to deal with if you plan to download by modem files such as the above-mentioned goodies, or to access radio-type messages areas.

Most BBSs require new users to fill out a questionnaire, giving their addresses and phone numbers. Some personal data may also be requested for statistical purposes, but is usually optional. The main point is to ascertain that the user is who he/she/it says they are.

The sysop will normally give you a ring within a couple of days to say "G'day" and then your ability to receive files and leave message is switched on. Experience shows that this simple precaution prevents abuse of computer systems, avoiding bad language, hacking attempts, etc.

When you consider that the sysop has a lot invested in hardware and time, such registration isn't surprising.

Many BBSs, like SWP BBS, are free for basic operations.

However, all such systems run at a loss to their operators and a small donation, even $10, is a help when the phone bill comes due or when the hard disk packs up.

For your donation, you will be allowed to use the BBS for a longer period each day and to download more files in that time.

You will also get that warm, fuzzy glow inside your gizzard that comes from supporting a good cause!

When you log on to any well-established BBS, all the above information is usually explained in various help screens.

Make a point of looking for these, as most of your immediate questions will be answered therein.

OK, folks, that last bit was your dose of castor oil for this issue of ONLINE! Gotta stop poundin' the processor and get back to SWP BBS.

Remember that you can drop by for a 'lectronic visit 24 hours daily on (02) 651-2411, or pay Australia Post an exorbitant amount of money to bring me a piece of paper with your message written on it.

In the latter case, grab your crayon in your hot little hand and scribble on that envelope;

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CBA examines the X FACTOR!

ALINCO DJ-X1 WIDE BAND RECEIVER

By Russell Bryant

Alinco, when it comes to scanners or wide band receivers, is relatively new and unknown in Australia. Its amateur equipment has a devoted following overseas, especially in the United Kingdom and it is also developing a niche in the Australian market.

The DJ-X1 wide band receiver is the company's first venture into the monitoring scene. As a first attempt, Alinco decided to go all out and supply the user with everything he/she could possibly want or need in a HF/VHF/UHF receiver.

HAVEN'T WE MET BEFORE?

The first thing that the DJ-X1 induces is a sense of deja vu, a feeling that you have seen this radio before. The fact is, it closely resembles the Icom IC R 1 in more than just physical appearance. Frequency range, function nomenclature and other specifications are on par with the Icom. The big difference is price, about two thirds that of the R 1.

Unpacking the Alinco, careful note is taken of the two antennae supplied, the thick rubber duckie for 'lowband', (0.5-150 MHz), and the more familiar bottom loaded whip for 'highband' (100 MHz and up). While two aerials can be a problem having to change them to suit the band, it is the best way to avoid the compromise that is built into every scanner/wideband receiver aerial.

The Alinco, unlike the Icom, is built in two halves, one containing the electronics, the other the batteries. Remove the battery pack and you can appreciate the micro-electronics that is the DJ-X1, it all fits into less than a 2.5mm (1 inch), thick case. The DJ-X1 stands 11mm (4 inches) tall and is 6mm (2 inches) wide at its widest point. The battery pack is approximately the same dimensions, so overall the Alinco makes a neat handful.

POWERHOUSE OF FEATURES

Built into this cigarette pack-size powerhouse is the latest in receiver technology and functions. The displayed frequency coverage is continuous from 100 kHz to 1300 MHz, however performance is guaranteed from 2-900 MHz. You have a choice of three reception modes, narrow band FM, wide band FM and AM, all user selectable, or you can have the radio automatically select the appropriate mode depending on the frequencies being scanned. Out of the factory the modes are largely only applicable to the Asian market, however they can be altered to suit local conditions.

Selectable tuning rates of 5, 9, 10, 12.5, 20, 25, 30, 50 and 100 kHz cover all listening situations that the user is likely to encounter, such as shortwave, AM broadcasts, FM broadcasts, aircraft and land mobile services. For those who insist on monitoring cellphones 30 kHz make the job easier. The DJ-X1 has 100 memory channels in total. They are divided into three separate groups, main, sub and scan. The main and sub groups have 40 channels each numbered 0-30 inclusive. The scan group has 20 channels, 10 for frequencies received during search, plus five two-frequency groups (upper and lower limits) for program scanning.

TRIPLE CONVERSION

To assist in the elimination of intermod and image rejection, the Alinco has triple conversion on NFM and AM and double conversion for the WFM band. The IF frequencies are not stated in the handbook, however they can be expected to be in the vicinity of 260 MHz, 10.7 MHz and 455 kHz. Selectivity (the receiver's ability to discriminate between closely located signals) while not spectacular is within acceptable limits, 15 kHz for AM/NFM and 150 kHz on WFM.

Sensitivity varies from 1.6 microV in the HF portion to .4 microV FM on the land mobile portions of the VHF/UHF bands. Now, one complaint, I found that in certain areas of Sydney it suffered from RF overloading, with adjacent channel rejection the main problem. Given the size and the electronics of the DJ-X1, I can't really see any way around this, maybe better shielding of the RF components? In areas on the fringe of capital cities or rural Australia the Alinco would have no problem, more than likely delivering interference-free reception.

The Alinco DJ-X1 is a departure from convention, the terminology and functions associated with the radio vary from what we are used to. Don't expect to find commands such as manual, lockout, search and so on, they are there, but not under those names.

THREE OPERATIONAL MODES

The DJ-X1 has three operational modes, VFO, Memory and Call Channel. The Variable Frequency Oscillator or VFO for short, allows the frequency to be changed at the desired step rate, continuously. In Memory mode those frequencies, together with the selected receive mode can be recalled and displayed on the LCD screen. In addition to the memory and VFO modes, the Alinco has a hangover from its amateur cousins, a 'Call Channel'. A frequency of particular interest can be programmed into the channel for instant access. Don't get the Call Channel confused with priority, it isn't, the DJ-X1 also has a priority function.

To help preserve battery life, the receiver will go into Battery Save Mode after five seconds of no activity. It will then cycle in and out of sleep mode at the factory set rate of 200 mS listen, 800 mS sleep. These rates can be altered to suit the individual by activation of the Duty

Within scientific circles the 'X' factor is always the unknown, in this case X equals Alinco.

key. One feature which impresses the user is the Lamp, not only does it illuminate the LCD in iow light situations, it also backlights the translucent keyboard. In no-light areas this will eliminate all confusion and mistakes.

While on the subject of the keyboard, it is well set out and can be used by people with large fingers without error. Not only are the keys splash proof they are raised above their background, unlike the Icom's which are recessed. Most keys are subtitled and perform multiple functions. The Alinco has three functions keys located on the side, where one would expect to find the Press to Talk normally associated with two-way radios.

Because the radio is small, it has to be that the speaker is also small. The reduction in speaker size can mean a loss of audio output and audio reproduction. While the delivered sound is a bit 'tinny' there is still enough grunt for all but the noisiest of locations. With the volume pot full-on there was no distortion or reverberation evident.

MORE FEATURES

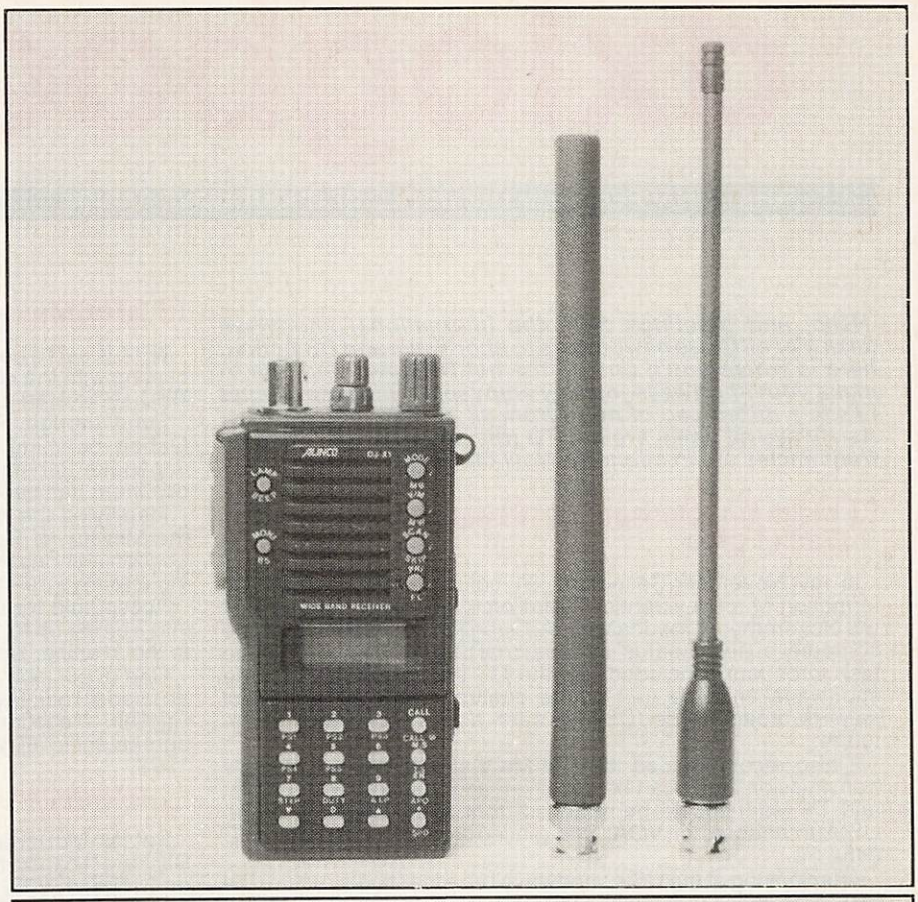
Other standard features of the DJ-X1 are, five user programmable search banks, Functions (keyboard) lock, Mode Select Scan, which only those frequencies of a given mode will be scanned and variable scan speeds (10, 15 or 20 channels per second). The antennae attach via a BNC, thereby permitting easy connection of an external aerial. Provision is also made for private listening through an earphone or headset, as well as tape recording from separate sockets. Both these connectors are on the side of the unit, making it difficult to fit the radio with earphone attached into a shirt pocket.

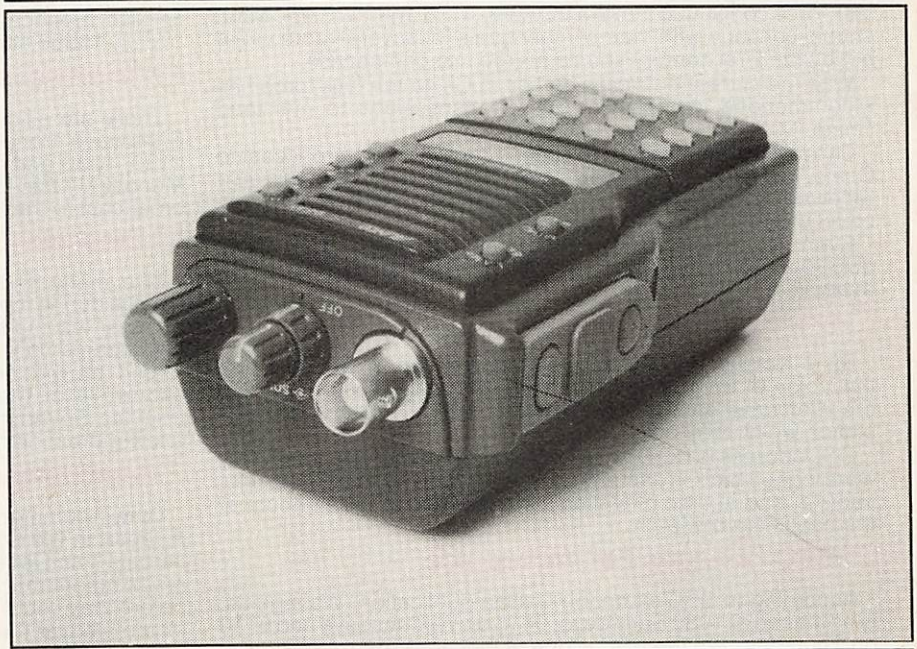
For use around the house or in a car, an external power source can be fitted to the Alinco. Both the external power jack ear and line out (recording) sockets have protective rubber boots, thus stopping dirt or moisture from entering the radio. Normally the radio requires 6 X AA size dry cells or nicad batteries to be fitted. As the radio was only on loan for a short time I can't give any indication as to battery life, however the specs say 300mA current drain while in receive mode and 24 mA in sleep mode.

ENGLISH HANDBOOK

The handbook is written in English with a minimum of grammatical mistakes or fractures of the written word. It contains large diagrams and step-by-step instructions that explain the DJ-X1 in simple terms.

Accessories that accompany the DJ-X1 are, dry cell battery pack, two antennae, belt clip, wrist strap and the aforementioned handbook.





OVERALL

Overall the Alinco DJ-X1 is a small neat little receiver (note, I have avoided using the term 'scanner' throughout the review) with large frequency coverage, plus a host of other desirable features and functions. The DJ-X1 only loses points in two areas, one is the adjacent channel rejection, the other is the inability to adjust the squelch without altering the volume, because of the concentric mounting of the controls and the lack of space on the top panel. Apart from that Alinco's venture into the monitoring market is loaded with all the features a discerning buyer could ask for. It has a price of around $500.

dxlogbook

with Rob Williams

WHAT'S HAPPENING IN THE WORLD OF SHORT WAVE RADIO...

Hello, and greetings from the international shortwave desk. For all those newcomers to shortwave and CB Action, here is where you'll find all the hot DX news and tips to make your shortwave journey enjoyable. This time around I have a mixed bag of news from all corners of the globe. As always all times are in UTC (the same as GMT) and all frequencies are in kilohertz. Now off we go.

☐ More On International Broadcasting Task Force

In my November/December '91 column I reported on the formation of a Presidential Task Force to look at the future of US Government broadcasting. Al Quaglieri has reported via the computer bulletin boards' International Shortwave Echo that the task force has concluded that the US should continue to use shortwave until the turn of the century, even though direct satellite broadcasting (DSB) is seen as the technology of the future.

It also recommended that TV Marti should close unless its transmission times can be improved and that both Radio Marti and TV Marti should be removed from under the wing of the USIA (managers of VOA) and placed under the aegis of BIB (RFE/RL).

After looking at the US's shortwave broadcasting structure the task force concluded that the VOA, RL, RFE and TV/Radio Marti should continue with their primary goals for several more years but by the 21st century should merge into one service.

With the current political situation in China the task force has recommended increasing VOA's transmissions to mainland China.

The task of establishing a "Radio Free China" to broadcast to China, Vietnam, North Korea, Laos and possibly Cambodia also received a favourable recommendation, and if established could use VOA's existing facilities.

Even so, the establishment costs could total as much as $US80 million, with operating costs of a further $US24 million every year.

☐ More Shortwave From Italy

Risto Kotalampi reports in the UseNet shortwave echo that the Voice of Europe, broadcasting from Italy, has returned to the shortwave bands. VoE presently relays RTCV, a local FM station which they own.

QSL address is PO Box 22 I-33170 Pordenone PN, Italy. They were logged back in January between 1400 and 2300 on 13640, varying, and at time of writing were planned to go 24 hours at the beginning of March.

☐ BBC Changes For Waveguide

According to BBC's London Calling publication, Waveguide, is now aired at 1030 Saturdays, 0415 on Wednesdays and 0130 on Thursdays. As the BBC is one of those "big guns" which can be heard around the clock I won't bother listing frequencies.

☐ Major Changes For Swiss Radio International

SRI is to change programming from 29th March. According to a report over Media Network SRI will now produce two separate program streams.

The first is aimed to Swiss citizens living aboard or travelling on short trips, and will consist of material in German, French and Italian.

The other feed will be for foreigners interested in Swiss developments and will be in English, French, Spanish and Arabic.

☐ NHK Moves Into Europe

NHK is set to become a powerful force in international broadcasting with the commencement of a relay agreement with the BBC set to start on July 1st.

Even though Radio Japan has broadcasting facilities in Gabon beaming to Europe as well as a service from it's Japanese transmitters at Yamata, reception across the vast continent has been poor.

Identifying the need to improve reception, a task force from the Ministry of Communications was sent to the USSR and London last September to investigate the possibility of organising a relay agreement.

Acceptable terms were reached with the BBC to broadcast into Europe up to 10 hours per day (five in the morning and five in the evening, local time), using 17.5 transmitter hours.

One or possibly two 250 kW BBC transmitters at Skelton will be used to radiate programs in Russian, German, Japanese and English. Negotiations are also continuing for an exchange agreement to allow the BBC to use transmitters at Yamata from 1993.

☐ Romania Update

Patrick McDonald reports on the BBS OzRadio forum that Bucharest can be heard to the Pacific from 0645-0715 in English on 21665, 17805, 17720, 15380, 15335 and 11840, with more English broadcasts targeted at Asia between 1200-1230 on 17720, 15365 and 15340.

☐ Shortwave Panorama Changes

There are also new times for popular Austrian DX program Shortwave Panorama. Broadcasts are now made at 1030, 1130, 1330 and 1530 on Sundays and at 0330 and 0630 on Mondays. Most frequencies remain the same except for their broadcast to the Far East which moves to 17730.

☐ Financial Crisis at Kol Israel

Like many shortwave stations trying to maintain a viable service during these tough times, Kol Israel seems on the verge of either leaving the shortwave bands or having their services being pared right to the bone. Serious money problems almost forced all the network's TV and radio services, including shortwave, off the air from March 1st, but a last minute reprieve from the Government has allowed them to continue for at least a few more months...so log them while you can!

☐ Mediumwave News

Darwin commercial AM station 8DN has ceased broadcasting. A report in the OzRadio Forum from South Australian DXpert Jerome Van Der Linden states that problems with their market reach meant that 8DN shareholders Austereo had to sell 8DN before they could commence a local FM service, and unable to locate a buyer they returned the 8DN license to the ABT.

One side effect of this is that 8DN's Katherine translator has also disappeared, depriving the town of a commercial radio service.

Also off the air is 4VL Charleville in Queensland, citing financial problems as the cause.

But they're not the only ones with a cash flow problem. Sydney stations 2SM, 2GB and 2KY have all figured in the media over the last few months.

2SM has been sold by the Catholic Church to a consortium which hopes to introduce a new format revolving around sport. With 2UW and 2WS due to move to the FM band in the next few months 2CH will be the only music station left on Sydney's AM band.

☐ CSM Starts Electronic QSL's

In a report via Internet, Senior Station Manager for CSM, Ed Evans, has introduced an experiment to send reception reports electronically. Using electronic mail facilities on the Internet computer network you can now send reports to them at "cee@wshb.csms.com".

Just fill in their "electronic QSL card" and E-mail it! Many stations have fax facilities for sending reception reports but to my knowledge this is the first time I've seen a broadcaster use e-mail to receive reports.

A sign of things to come?

☐ The Give-Away

Elsewhere in CBA is a review of the 1992 editions of the World Radio TV handbook and the Passport to World Band Radio. With the kind assistance of Dick Smith Electronics we have a copy of each book to give away to two lucky readers of this column (one book per reader).

All you have to do is write and tell me which books you would like to win, and why. Entries close May 29th, and if you can't wait that long I suggest you visit your nearest DSE store and check these books out for yourself - they are great DX investments.

☐ Glen Hauser On The Move

World Of Radio may be the hardest program to keep track of on shortwave, with station programmers moving host Glen Hauser around from one timeslot to another.

As this column is being typed up, WOR on WWCR goes out on Saturday mornings our time (Friday UTC) on 12160 at 2230. WRNO has a broadcast on Sundays at 0100 on 7355 and at 2130 on 15420.

DX Titbits

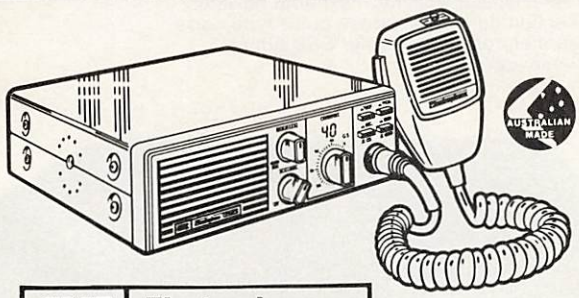
- HCJB have a new address for correspondence: Box 17-17-691, Quito, Ecuador, South America.
- Moscow's newest shortwave service is Radio Galaxy: try 2000-2300 on 9880 for English broadcasts.
- Keep listening for newcomer WJCR, from Kentucky, USA. It's been reported that they will use 15660 and 7490 as their primary channels with 15676 and 7540 as secondaries. Their on-air date was the 29th of February, using four 50 kW transmitters operating in pairs with a service to Europe and Latin America.
- World Of Radio reports that Radio Miami International has been given a construction permit to build a 50 kW transmitter for an international shortwave service. Construction must be completed by May 1993.
- Craig Seager reports that AWR via Novosibirsk was expected to start broadcasting in March with English between 0100-0200, 0700-0800 and 1300-1400 on 11855, and 1900-2000 on 9835.
- BBC's transmitter site at Daventry is now part of history. RCI used it for their relay of Canadian programs into Europe. Replacing Daventry, RCI will use Skelton.

So there you have all the latest tips... I hope propagation is favourable for you and all those overdue QSL cards start to flood in.
As always if you wish to contact me write to;

Rob Williams
PO Box 108,
Minto,
NSW 2566

and remember to include a SSAE if you want a personal reply.

GME Electrophone



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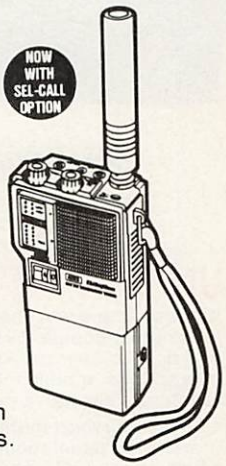

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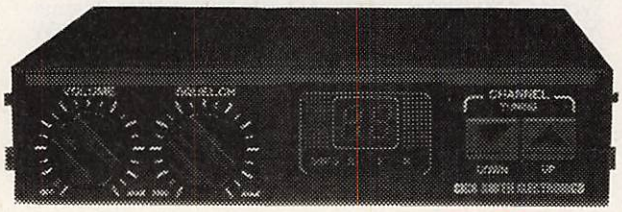

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Elegant styling, compact design and the convenience of pushbutton tuning. At just 140 x 30 x 130mm it doesn't take up much room on your dashboard. DOTC approved.

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- PA facility (requires optional speaker)
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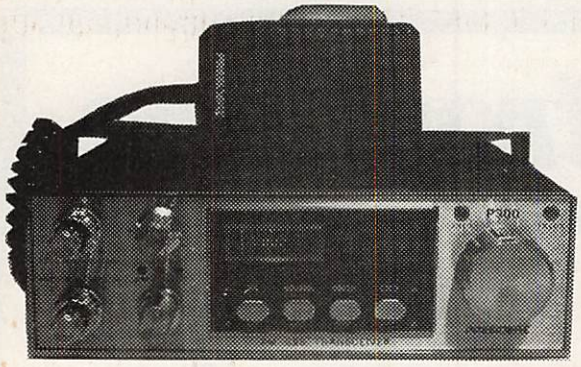

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- Back-lit analogue Signal/RF output meter
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Cat D-1806

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This high quality 2 position 50 ohm coax switch is suitable for HF, VHF and UHF uses up to 1000MHz. It offers superb isolation, low insertion loss (<0.1dB @ 1000MHz), and 1kW PEP HF power rating.

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Revex model S20

Also available model S20N (Cat D-5202) with N connectors **$99.95**

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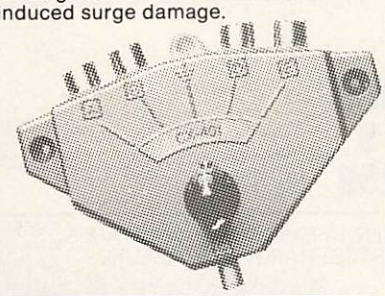
With Surge Protection!

4-WAY COAX SWITCH

A high quality 4-way coax switch featuring rugged die-cast aluminium construction, 2kW PEP (max.) power handling at 30MHz, and only 0.3dB insertion loss. What's more it has an in-built surge suppressor and automatic grounding of all un-used connections to help protect against lightning induced surge damage.

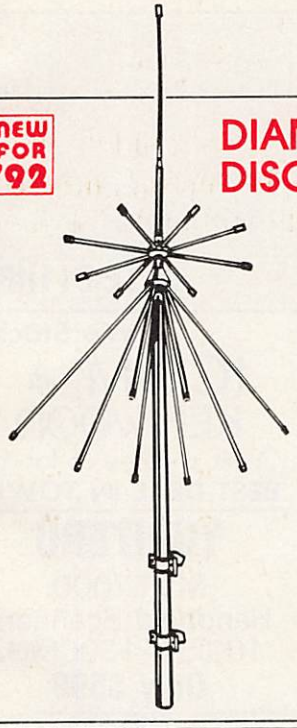
Cat D-5204

$89.95



NEW FOR '92

DIAMOND D-130J DISCONE ANTENNA



This quality Japanese discone antenna covers the frequency range 25-1300MHz, and was designed to be easy to assemble and install. The extensive use of stainless steel in the D-130J makes it very durable, while the wide frequency coverage makes it ideal for use with scanning receivers. Can also be used for transmitting on UHF CB, 6m, 2m, 70cm and 23cm bands. Comes complete with mast mounting hardware and instructions.

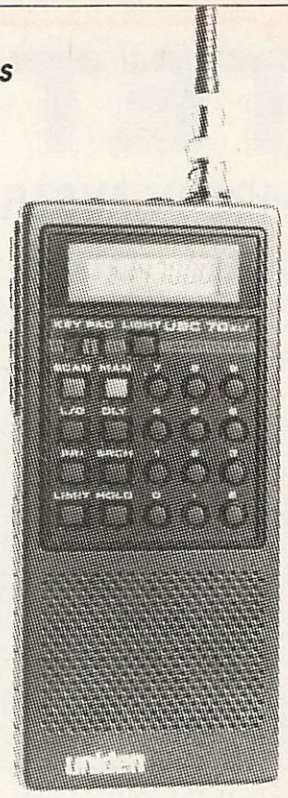
Cat D-4840

DIAMOND ANTENNA

$159

Exclusive to Dick Smith Electronics

UNIDEN 70 XLT HANDHELD SCANNER



Now here's value! This high quality handheld scanning receiver from Uniden is a gem. It's very easy to operate, has 20 memories, 8 band coverage, receiver track tuning, and it comes with a rechargeable NiCad battery pack, approved AC charger and durable carry case. What's more, it's lightweight and small enough to fit in the pocket.

Frequency Coverage:	66-88MHz 136-174MHz 406-512MHz
Sensitivity:	0.4uV 66-88MHz 0.5uV 136-174MHz 0.7uV 406-512MHz

Cat D-2740

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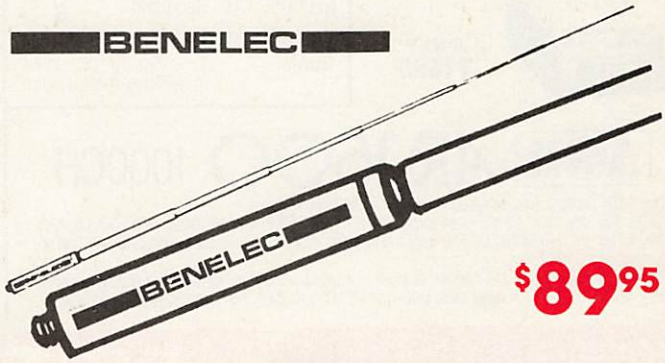
A superb high gain ground independent base station antenna, from Benelec. It uses a tuned matching network in a sealed, thick walled, base housing. This allows high power operation while maintaining low SWR across the band. High quality T81 grade aluminium tubing and stainless steel screws ensure excellent reception and durability. The base section is water sealed with a DC ground path for static reduction and an SO-239 socket for easy coax connection. Comes complete with mounting hardware for connection to your mast.

Cat D-4430

BENELEC



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This dual drive system uses a special feed arrangement which feeds the reflector and radiator elements. This method produces a wider frequency coverage (see SWR CURVE), higher gain and excellent F/B RATIO which is roughly comparable to adding an additional element to a conventional BEAM DESIGN.
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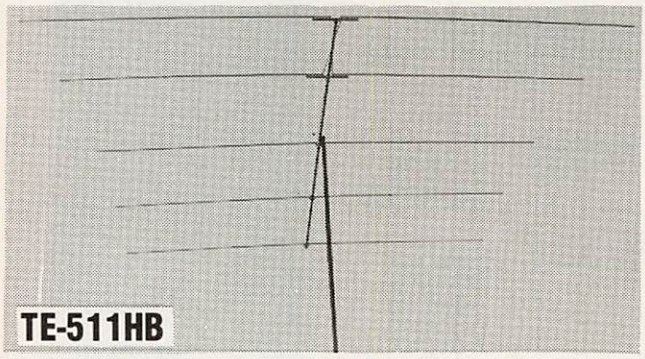

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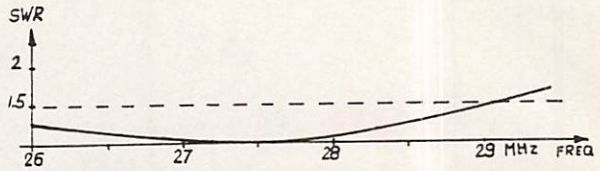
BAND	26 to 29 MHz	GAIN	MIN. 10dBi/7.8dBd
F/B RATIO	25 dB	POWER	2 KW
BOOM LENGTH	5 M	MAX. ELE. LENGTH	5.3 M

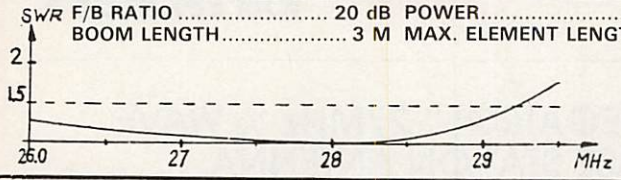
ONLY $ 259



THIS NEW TET-EMTRON 3 ELEMENT DUAL DRIVE TE-311HB ANTENNA FAVORABLY COMPARES WITH 4 ELEMENT BEAMS. ITS ALL ALUMINIUM AND STAINLESS STEEL HARDWARE ASSURES LONG LIFE AND RELIABILITY.

SPECIFICATIONS:

BAND	26 to 29 MHz	GAIN	MIN 8.5 dBi/6.3 dBd
F/B RATIO	20 dB	POWER	2 KW
BOOM LENGTH	3 M	MAX. ELEMENT LENGTH	5.3 M



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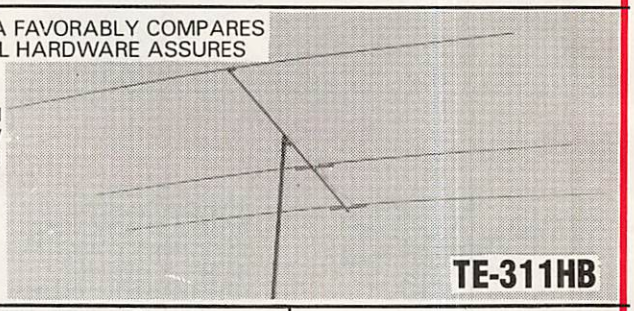

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WASHINGTON) — Discontinued.
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AOR AR 1500 1000CH

The AOR factory has advised us on 30/3/92 as follows:
"AOR Factory has, so far, not exported a single 'EXPORT MODEL' AR1500 TO ANY COUNTRY IN THE WORLD. The very first export models will become available ex factory during June 1992."
Beware of the inferior JAPANESE domestic models which are deficient in many aspects. The AR1500 export model available from EMTRONICS, the factory appointed agent.

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hf utilities

with Richard Jary

WHERE TO LISTEN and WHAT'S BEING HEARD

It's been a fairly quiet month on the HF Utility front around this way over the past couple of months, and indeed on most things radio related. However I've just come back from the Gosford Amateur Radio Club field day and resisted the temptation to buy all the shiny new Icom R9000s, packet radio TNCs, scanners and the like. Managed to limit myself to a scanner aerial and DC adaptor for the car.

» More On AXM/AXI

Following our news last issue about the Bureau of Meteorology facsimile broadcasts, I received an informative booklet by Michael Kenny of the Bureau's Melbourne branch. Michael was reading the article during summer holidays at the beach - and what better way to relax than to read CB Action - when he saw my plea for help! The book gives various technical specs for the broadcasts, but they are fairly standard as I've picked them up without having to fiddle around too much. If anyone wants more info, send a stamped self-addressed envelope to me at the old PO Box E160, St James, NSW 2000 and I'll forward a copy of the relevant page.

Station AXM originates from Melbourne and is transmitted from the RAAF Gungahlin transmitters near Canberra running 5kW. This site is closing soon and the transmission will relocate to Belconnen, another Canberra suburb, later this year.

The frequencies given are AXM31 on 2628 kHz from 1100-2100 UTC May to July, and 1700-2000 August to October; AXM32 5100 kHz, AXM34 11030 kHz, AXM35 13920 kHz, and AXM37 20469 kHz 24 hours/day. 20469 will be suspended for the 2628 channel during its periods of operation. The other Bureau of Meteorology station, AXI, is fed from the Bureau's regional office in Darwin and is sent by landline and microwave to an RAAF site 17 miles south of Darwin.

Darwin operates AXI32 5755 and AXI33 7535 kHz from 1100-2300 UTC, AXI34 10555 24 hours, and AXI35 15615 plus AXI37 18060 from 2300-100 UTC. Output power from Darwin is 10 kW.

Both stations transmit a number of different pictures on fax. The full schedule takes up a bit of space, however your best bet is daily at 0115 UTC on AXM and 0030 UTC on AXI. The usual fax format is used for these transmissions.

» Logging Sigs From Space

Since I began writing this column we've had plenty of talk about the Space Shuttle frequencies. It's probably about time to finish that topic off for a while but I now have a fairly large list of valid channels, and guess that Space Shuttle launches could be some of the more interesting traffic on HF. So I'll get carried away and get it all over and done with in one big hit.

The Goddard Space Flight Centre Amateur Radio Club relays the Shuttle voice audio on 3860, 7185, 14295, 21395 and 28650 kHz. AMSAT Oscar 13 also has a relay on 145.945 or 145.955 MHz secondary for those with a good satellite antenna.

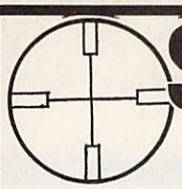
From the NASA HF listings, and concentrating on the HF ones that may propagate to this side of the planet, try the following - all in kilohertz:

2405 Data Buoys
2622 SRB Recovery (Primary)
2664 Backup Mission Audio
2678 ETR Range Control
2716 Navy Harbor Control
2764 SRB Recovery Channel
3024 Coast Guard SAR
3187 SRB Recovery Ships Channel
4376 Primary Recovery Zone SAR
4510 SRB Recovery Ships Channel
4856 Cape Radio/Leader
4992 Cape Radio/Coast Guard
5180 NASA Tracking Ships
5187 NASA Tracking Ships
5190 ETR Primary Night Channel
5350 Launch Support Aircraft
5680 Launch Support Ships
5810 ETR Secondary Night Channel
6720 SAR Primary Atlantic
6837 Cape Radio
6896 Cape Radio
7412 SAR Comms to Bahamas
7461 Cape Radio/Launch Support
7525 NASA Ground Tracking
7676 Launch Support Aircraft
7765 SRB Recovery Ships
7919 Data Channel
7985 Data Channel
9022 Launch Support Aircraft
9043 Launch Support Aircraft
9132 Launch Support Aircraft
10305 Space Missile Tactical Net
10310 Malabar-Ascension MUX
10780 ETR Primary Day Channel
11104 SRB Recovery Ships
11252 Launch Support Ships
11407 SRB Recovery Ships
11414 Cape Radio
11548 Cape Radio
11621 SRB Recovery Ships
13227 Launch Support Aircraft
13237 Data Channel
13495 Data Channel
13600 Malabar Ascension MUX
13878 Launch Support Aircraft
14937 Ascension-Malabar MUX
18009 Launch Support Ships
19303 Launch Support Ships
19640 Cape Radio
19966 Ascension-Malabar MUX
20186 Launch Tracking Net
20192 Malabar-Ascension MUX
20198 OCC Shuttle Audio
20390 ETR Secondary Day Channel
22755 Ascension-Malabar MUX
23413 Cape Radio

» Fax Freq's

Phil from Canberra has a list of various fax frequencies recently logged by him. Some of these are: MET Wellington New Zealand on 16339; MET Pearl Harbour, Hawaii 21838; MET Tokyo, Japan 16229; MET India 8613; MET Italy 8381; JJC Tokyo on 17068; and Tokyo News Pager on 22541 kHz. All these transmit in USB and can all be heard from south east Australia.

You can write to me at PO Box E160 St James 2000, and if you're into computer communications you can also contact my via the FIDOnet bulletin board system, which Patrick McDonald has explained to you all by now. My address there is 3:711/907.1, or on Patrick's board at 3:713/605. Hope to hear from you soon.



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LASER-6 DUAL-POLARITY BEAM
(3 x Horizontal and 3 x Vertical) . . **$250**

LASER-8 DUAL POLARITY BEAM
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SCANTENNA-XLR 16-ELEMENT DISCONE (25 - 1300 MHz) . . . . The ultimate scanner antenna
100% Australian designed and manufactured . . . **$160** including insured freight
If you're not using a Scantenna-XLR you're not getting the best from your scanner!

Compact VSWR/PWR meter **$29.50**
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20dB variable receive pre-amp **$49.50**
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Genuine "ESG" Queensland scanner frequency register 1992 EDITION ..... **$32** INCLUDING P&P

SSB ENGINEERING . . .VOLUME 1 covers crystal switching methods, synthesized rigs, and early PLL rigs. The mountain of slide information makes this book a classic. Price $15, $1.50, P&P.

SSB ENGINEERING . . . VOLUME 2 covers "second generation" PLL rigs, has updated information on many of the oldest rigs and includes some build-it-yourself test equipment projects. Price $17.50 $1.50 P&P.

SSB ENGINEERING . . . VOLUME 3 covers the latest PLL-ICs, has a ham radio modification section and an AM to FM CB conversion section. Price $20. $1.50 P&P.

THE CB MODIFICATION HANDBOOK covers Australia's most common CB radios. Everything from a few extra channels to full-house conversions covering hundreds of channels. 5 kHz steps, increasing power, slides etc. Price $15. $1.50 P&P.

THE CB PLL DATA BOOK is the CB modifier's Bible. This all-new international edition covers fifty specific phase-locked loop ICs, with manufacturers' cross-references. Price $15, $1.50 P&P.

THE SCREWDRIVER EXPERT'S GUIDE will enable the average non-technical CBer to locate and repair up to 95% of CB radio problems, as well as helping the advanced hobbyist to tune and modify hisequipment for improved performances. Price $15. $1.50 P&P.

CB ANTENNA CONSTRUCTION, illustated plans for quarter-wave and half-wave ground-planes, two-element quad, three-element beam, and high-performance stacked beams. Price $3 including postage.

HAM AND CB ANTENNA DIMENSIONS 130 charts covering dipoles, beams, quads, vees, triangles, and verticals. An essential reference work for any serious antenna builder, this book covers the CB band, HF bands from160 metres to 10 metres and the 2 and 6 metre bands. Price $15, $1.50 P&P.

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Build your own

HIGH GAIN UHF YAGI ANTENNA

Courtesy Ken Reynolds - Power Band Communications

The antenna to be described here is a commercial design for UHF CB manufactured by Power Band Australia.

It is an all aluminium design having eleven unequally spaced elements with tapered length directors. The claimed gain is 14dB over a dipole give or take a little remembering measurement problems and has been optimised for forward gain without attention to other factors.

The array is light, weighing in at less than 1kg and measures about 2 metres in length. The specifications detailed in this article are published with the consent of the manufacturer who claims that, "We would prefer to supply detailed plans for the UHF/11E antenna rather than see the results of inferior copies which generally degrade the product. We don't expect detailing this design to adversely affect the market because there are always customers who prefer to buy a tailor made product than to manufacture their own.

CONSTRUCTION

Minor changes have been made to the element mounting and matching arrangements to enable the home constructor to produce a working model without the need of specialised equipment. The modifications are only token and will not degrade the overall antenna performance.

The antenna has eleven elements made from 6.5mm (quarter inch) aluminium tube which pass through a 19mm (three quarter inch) square section boom.

They are offset from the boom's centre mainly for ease of coupling to the parallel matching section, however, it is not important whether you drill the boom centrally or not.

What is important when drilling the boom is keeping your drill perpendicular to the face so that all holes will penetrate the two opposite surfaces squarely.

When preparing the boom for drilling it is often better to carefully mark and centre punch both sides and then drill each separately unless you have access to a drill press. Holes can be aligned quite accurately with the use of a metal or woodworking square.

Elements in the original antenna are retained in position by a grub set-screw held by a special tapped rivet insert.

Since these are not readily available and the insertion tool is very expensive, two alternative methods are given in figure 2, (a) and (b).

The two parallel matching arms are made from scrap lengths of 6.5mm tube left over after cutting the elements. They are flattened for a short length at each end. This can be accomplished by squeezing in a vise or careful hammering on a flat piece of solid metal. They don't have to look great as RF can't tell one way or another. Although the plan calls for an insulating block made from polystyrene or similar good insulating material, almost any piece of strong plastic will do.

The plastic PVC lid from a conserve jar will serve OK but don't weaken it too much by trimming as dimensions are not critical provided the mounting points are accurate.

Matching arms are attached to the driven element with quarter inch hose clips. There are probably alternatives but the Utilux brand type H-180 is ideal, however, they have become a bit tricky to find in the last few years - try the automotive accessories shops as a starting point.

They can also be used to attach the solder lugs for connecting the 4:1 balun transformer to the matching arms instead of using nuts and bolts.

For that matter, the driven element can be drilled, however, this will weaken the tubing and if the holes are not drilled accurately considerable strain can be

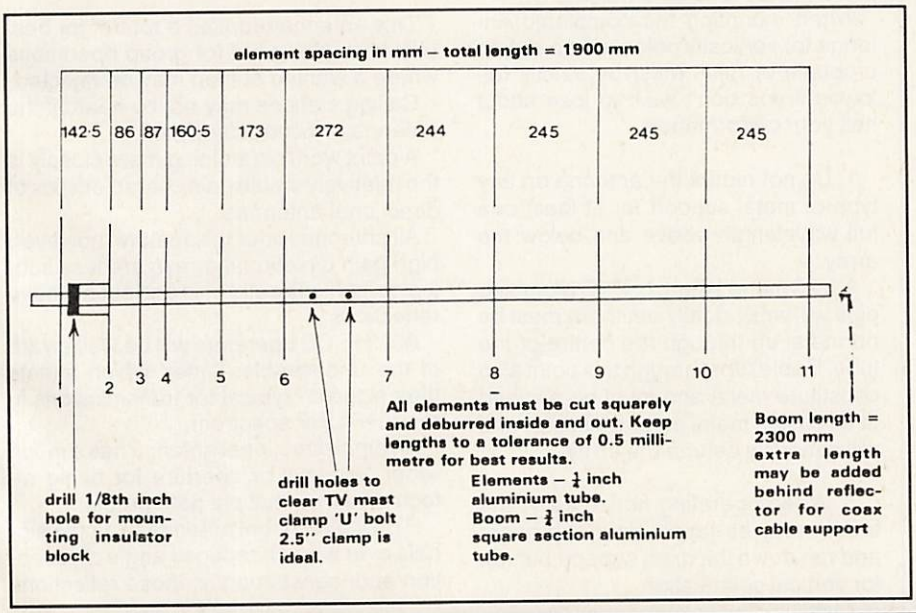


Fig 1 (left)

Note that the elements must be centred accurately through boom. They must be parallel to each other and closely in the same plane. If your drilling is inaccurate, the elements may be straightened by bending after they are locked into position.

continued over page

Fig 2

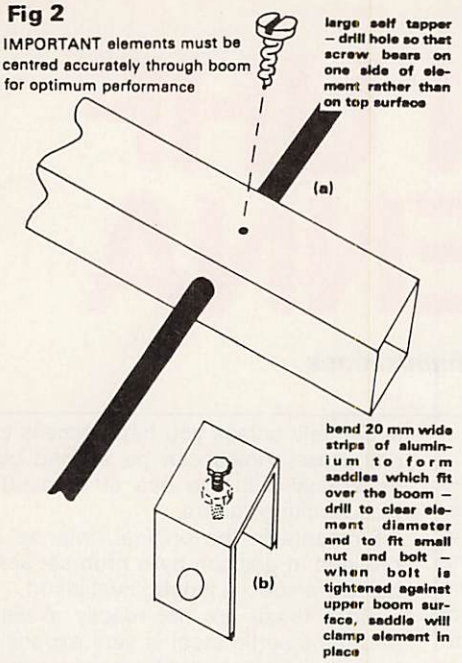

IMPORTANT elements must be centred accurately through boom for optimum performance
large self tapper – drill hole so that screw bears on one side of element rather than on top surface
(a)
bend 20 mm wide strips of aluminium to form saddles which fit over the boom – drill to clear element diameter and to fit small nut and bolt – when bolt is tightened against upper boom surface, saddle will clamp element in place
(b)

Fig 3

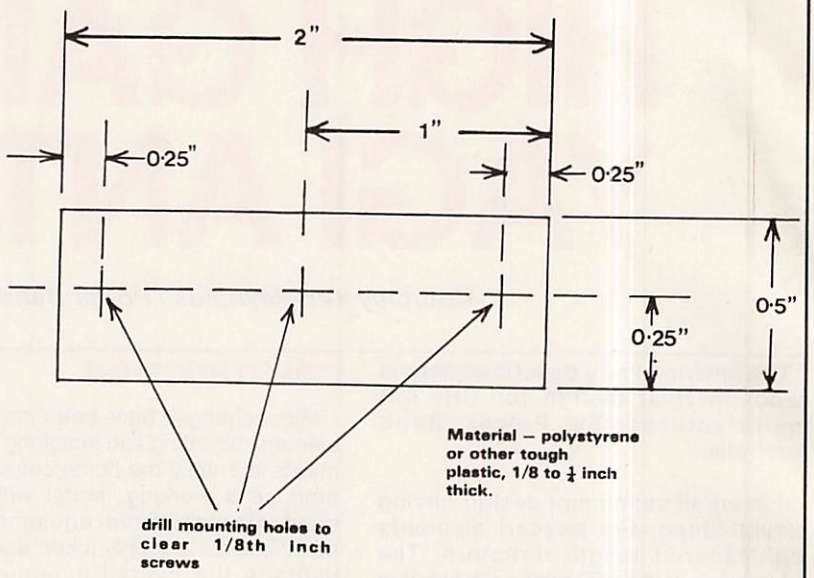
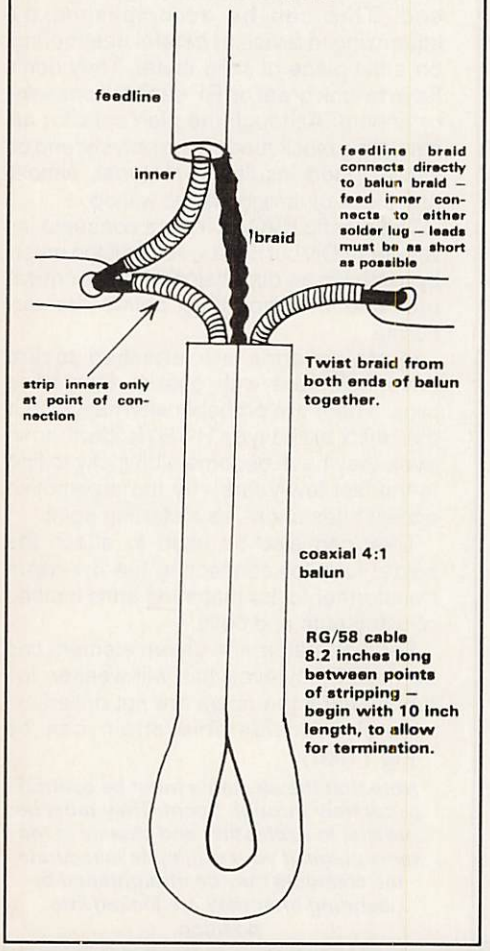


Fig 4


BALUN TRANSFORMER CONNECTIONS
feedline
inner
braid
feedline braid connects directly to balun braid – feed inner connects to either solder lug – leads must be as short as possible
strip inners only at point of connection
Twist braid from both ends of balun together.
coaxial 4:1 balun
RG/58 cable 8.2 inches long between points of stripping – begin with 10 inch length, to allow for termination.

placed on the driven element by the matching arms when the screws are tightened and it is possible to break either tubing.

Clips are the best and they are adjustable. The antenna can be mounted for vertical or horizontal polarisation but since most stations are operating vertical, this plane will be desirable for most installations. Vertical polarisation is also the only method authorised by DOTAC.

The only critical part of construction is that all measurements be closely followed and tolerances should be held to within half a millimetre if optimum performance is to be obtained.

When mounting the completed antenna for vertically polarised operation a couple of rules must be strictly followed if you don't wish to lose about half your performance.

1. Do not mount the antenna on any type of metal support for at least one full wavelength above and below the array.

A 1.25 metre length of PVC plumbing pipe will work ideally but there must be no metal up through the centre of the tube. Cable runs through this point also constitute metal and must be avoided at all costs - metal means disaster and will seriously detune the array.

2. When operating horizontally, the feeder may be taped along the boom and run down the mast support but not for vertical polarisation.

The feed cable should be extended out from the rear of the boom and 'drop down' for at least one half wavelength below the tip of the reflector element before tying the cable in against the supporting mast.

It is a good idea to increase the boom's length by an extra 30 cm or so to permit good clearance of the coaxial cable

ADVANTAGES

Increased gain and improved signal to noise ratio. Ability to reject unwanted signals. Rejects flutter and fading by offering relatively constant gain characteristics.

DISADVANTAGES

This antenna requires a rotator for best utilisation. Not good for group operations where a wanted station may be rejected.

Calling stations may not be heard if the antenna is incorrectly aimed.

A point worth examining more closely is the relatively stable gain characteristics of directional antennas.

All antennas offer this feature, however, high gain directional arrays are less subject to 'multiple path' or in and out of phase reflections.

All UHF CB operators will be well aware of the undesirable 'flutter' which affects their signals - typical for transmissions in the VHF/UHF spectrum.

An omni directional antenna has a much wider 'window' or aperture for being affected by this multiple path problem.

Highly directional antennas sample signals over a much reduced angle of reception and, consequently, those reflections

occurring outside its main angle of acceptance are more or less disregarded by the array leading to this 'more constant' gain effect.

Therefore, flutter and fading in a directional system is mainly experienced when out of phase signals occur at an angle within the main lobe of radiation.

NOTE

There are many ways to match the impedance of a driven element and that shown here is only one.

A folded dipole could be used but they are more difficult to make and require different ratio sides or other matching techniques.

Gamma matching is another alternative which will work well but tends to be more susceptible to corrosion and will likely cause a skew of the main radiation lobe.

All miscellaneous hardware (nuts and bolts etc.) should be plated steel - brass or copper should NOT be considered because of aluminium's high susceptibility to electrolytic action with these materials.

Where solder lugs connect to the matching arms the lugs are usually tin plated brass - a plated steel washer should be fitted to both sides of each lug.

This will help prevent 'local action' and provide a buffering point for the inner copper wire from the balun transformer. It is a good idea to finally spray these points with plastic lacquer for added protection.

Table 1
ELEMENT LENGTHS FOR ARRAY

Number	LENGTH in millimetres
1	305
2	292.5
3	271
4	266
5	266
6	267.5
7	264.5
8	264.5
9	264.5
10	264.5
11	264.5

BASE STATION INSTALLATIONS

Here are a few guidelines to assist with your home base installation.

1. The antenna must be securely mounted to mast or tower (see figure 1).

2. Coax cable must be strapped or tied to mast and not allowed to hang free.

3. All external coax connectors must be weatherproofed with Silastic, Telcohesive or similar type products.

Coax cable installations are far too costly to be ruined by allowing the ingress of dust or moisture.

If you are inexperienced in the termination of coax connectors or coax cable then seek professional help with your UHF installations.Some guidelines for using coax cable in UHF installations:

* RG58C/U quarter inch OD. Maximum preferred length 15 feet - mobile installation or short jumper lead.

* RG8/U Foam half inch OD. Maximum pre-ferred length 50 feet -home or fixed base use, probably the type for short runs with quality/cost factor.

* Heliax cable half to 7/8 inch OD. While larger diameter cables are available, cost would probably prohibit use for use in runs over 50 feet.

Power Band Communications, designer of the antenna, warns that the design published here is copyright and production of the antenna for resale is expressly forbidden. Offenders when detected will be prosecuted.

A CB Action D-I-Y Project...END

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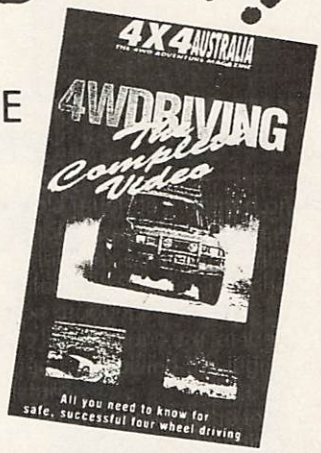

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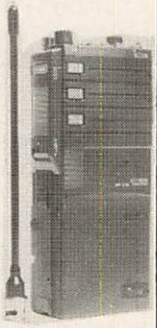

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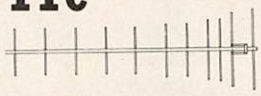

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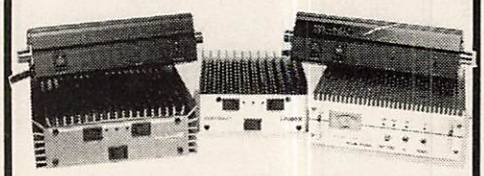

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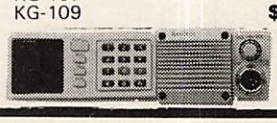

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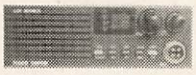

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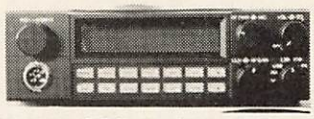

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AUSTRALIAN ASSOCIATION OF CITIZENS BAND RADIO OPERATORS INC.

Although ACBRO is based in South Australia, they lobby on a national basis in respect to many problems confronting CBers. We're happy to make space available on a regular basis for them when the subject is national or of national interest as is the following material.

6th February 1992

Mr T G Colwell
Treasurer
ACBRO Committee
PO Box 170
WALKERVILLE 5081

Dear Trevor,

I refer to your letter concerning the recent increase in the licence fee levied by the Government for the use of Citizens Band Radio transceivers.

After investigation with the Department of Transport and Communications, I have been advised that it is **their policy to round off license fees to the nearest dollar**. In this instance, the increase of 3.4% increased the fee from $17.00 to $17.58, which meant that it was rounded off to $18.00.

Perhaps your committee would like to consider this and advise me if you would like me to take this any further. I could try to raise this matter in the media or the Parliament.

However, I have been assured by the Department that if, as is likely, the rate of inflation next year results in an increase of less than 50 cents then it will be rounded down. That is, the fee will remain at $18.00.

I will certainly monitor the situation to ensure that any future increases that are less than 50 cents are rounded down.

Yours sincerely,
Grant Chapman,
Liberal Senator for South Australia.

ADELAIDE WITHOUT UHF REPEATERS

Adelaide, the capital city of South Australia, is bereft of any repeaters to cater for the UHF CBers. Where most similar cities around Australia are able to boast of three of these useful amenities, as was Adelaide, now simplex operation appears to be the way to go.

We understand that the last of these repeater services is shortly to be switched off, basically for the reasons of abuse and loutish behavior.

Adelaide CBers on UHF have for some time accepted that 1/31 has not been operating, and more recently, 3/31 has been off more than it was on.

Now, shame as it may be, the voluntary service that could be of use to all operators of the band at some time, has been reduced to the less efficient simplex mode.

Talk at Committee level of ACBRO seeking a sponsor to apply for the Channel 1 license has taken place, but to date no concrete plans have been made.

From a chat with DoTaC Adelaide, we understand that Philips still hold the license for Channel 3, and the fact that it is not working is obviously as a result of vandalism, and apparently nobody is pressuring them to make it "talk" again.

In the country, at Goolwa, another channel 3 is due to be operating soon, as DoTaC has issued a license for a new repeater which will also serve the Victor Harbor area.

February 25, 1992.

Senator Grant Chapman,
16 Topham Mall,
ADELAIDE SA 5000.

Dear Sir,

Thank you for your response of 6th. Inst. pertaining to our concern regarding the increase to C.B. license fees.

This matter has been discussed further with some of our Committee and also at a members' gathering recently held. It was a unanimous response from those consulted that your offer to pursue this matter further should be accepted.

For this reason, we enclose a copy of prepared material on this subject for our next members' magazine.

It may be helpful for you to gain a clearer picture of the implications of the Department of Transport and Communication's policy of "rounding up" to the nearest dollar, particularly where the multiple license holder is concerned.

To adopt this policy in respect to license fees for T.V. stations who pay fees in the thousands, may be acceptable; but to add this impost to the many obligated individuals as CBers, many on pensions and limited resources, is most unjust.

We do feel that this matter should be questioned or exposed both in the "press" and the Parliament.

We avail ourselves should you require more information to serve this aim.

Yours faithfully,
for **ACBRO Inc.**
T.G. Colwell,
Treasurer.

THE $166,000 LICENSE FEE RIP-OFF

The allegations of a $166,722 "Rip Off" of the CB community by DoTaC in respect to license fees was brought to the attention of ACBRO members in the January edition of their newsletter.

A letter seeking assistance from one of Acbro's Patrons, Senator Grant Chapman was also published.

Following Senator Chapman's investigations, he has replied with the accompanying letter which may well amaze readers, now, to learn that DoTaC openly claim that they have a policy which is apparently not in accord with the office of their "Boss", the Minister for Communications.

This policy is, that they round off license fees to the nearest dollar.

It is reasonable to think that they do this knowing that the facts previously published in the ACBRO newsletter are correct, and that they are "ripping off" the CB community to the tune of about $166,000.

The morality of this must be questioned, and this will be the answer from ACBRO to Senator Chapman's question.

The way in which Government would pounce on individuals in private enterprise who operated on the DoTaC "shonky" policy with costing, should be considered after study of this page 10 feature.

The concern of ACBRO is justified in pursuing this matter.

The facts are, that they approached the Minister for a pledge of no increase over a twelve month period.

They were unsuccessful in having this request granted, but secured a "quote" to help thousands of CBers budget their funds for the future.

The quote given was said to be binding for a twelve months period, and within three weeks the "Doctor" (DoTaC) ignored the quote on the basis of what appears to be book-keeping expediency.

"Rounding up - or rounding down", the CBer accepts, - but to the nearest five cents, **not the nearest dollar.**

NOT ON - Mr. DoTaC - with all this talk about a level playing field, you must be made to be on the level with CBers and operate your shop on the same basis of costings as the corner "deli" or supermarket.

ACBRO AFFILIATED CLUBS

Below is a list of clubs and organisations affiliated with ACBRO Inc. If you have one of them in your area, please give them your support of membership. Full details can be obtained by ccontacting the group of your choice from below.

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MS

For more information about multiple sclerosis contact the MS Society in your state.

Pearce Simpson ST-901...building on success

By Ken Reynolds from POWER BAND COMMUNICATIONS

If you think Hatadi's new sideband offering looks a tad familiar when you look at the picture above ... you are right again! No, wait a minute, there is something different. That's it, somebody's done a switcheroonie with the LED indicators and the slide switch panel. Yep ... that's it.

That looks like a ...

Yes, the new Pearce Simpson ST-901 does bear a striking resemblance to a very successful am/ssb transceiver produced by another manufacturer. In fact the case size is almost identical and even the lightweight steel sub-frame is fabricated so similarly it's almost a sin.

Instead of re-inventing the wheel, the designers of the ST-901 have looked around at other existing designs - much the same as the car manufacturers have done - and incorporated into a new product of their own what they considered to be important features.

Then you start to notice a few differences.

Before you know it the ST-901 begins to emerge with its own identity and you realise that it is the all black with 'chrome' trim coloring and the control panel layout that leads you up the ol' garden path a bit.

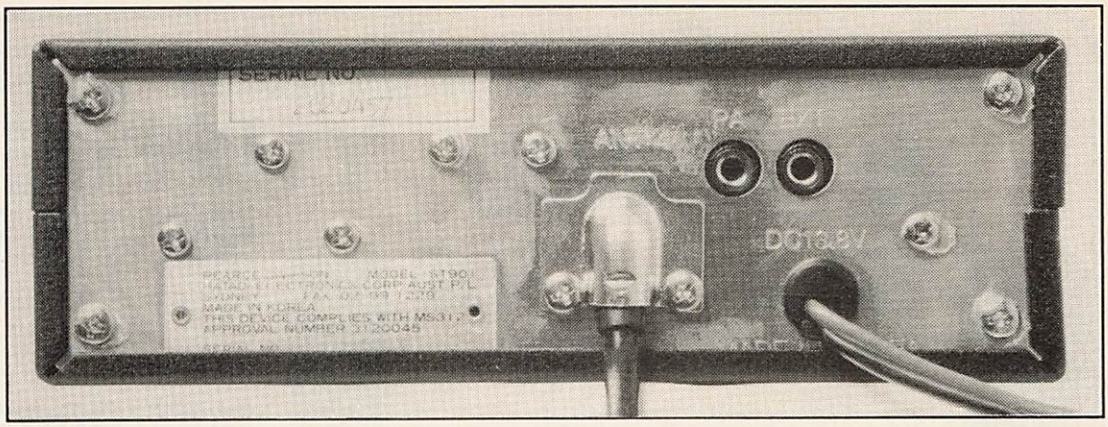
Pearce Simpson has gone for the pigtail style antenna connector in this model too with the power cable inlet also on a flying lead to leave the back-side free from clutter.

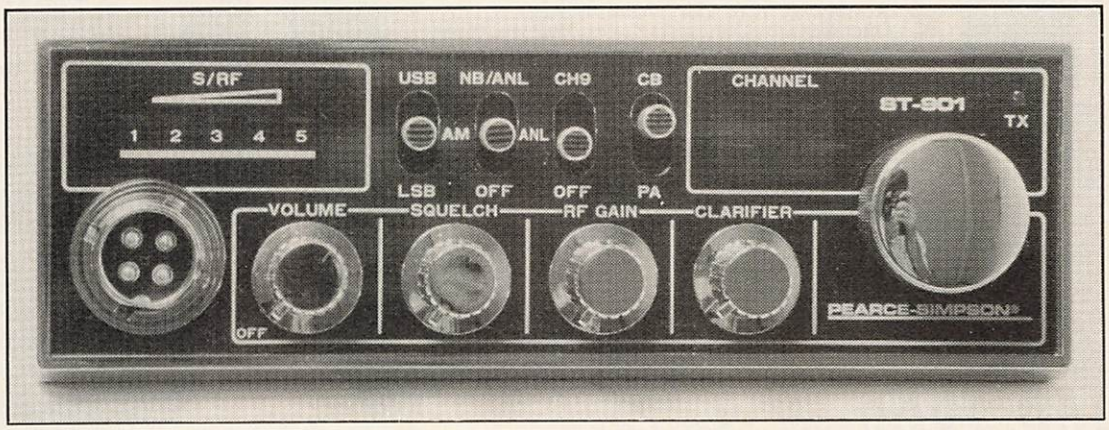
This is so the rig can be mounted right up close to a rear bulkhead without the need to leave extra space behind the set for antenna connector and cable.

On the left of the shiny black fascia is a four pin mike socket with a combination received signal strength and power output indicator employing five side-by-side red LEDs. In receive mode the LEDs indicate the following signal strengths:-

They say that imitation is the sincerest form of flattery, but the new ST-901 am/ssb transceiver takes it one step further.

Front panel has good-sized controls and LEDs are easily read. Rear of rig features the usual PA and Ext speaker but has the added plus of the "pig-tail" type coax connector and "flying lead" type powerline.





First LED
= 2.5 micro volts.
Second LED
= 3.5 micro volts.
Third LED
= 5.5 micro volts.
Fourth LED
= 15 micro volts.
Final LED
= 500 micro volts.

As you can see from the table, the scale is fairly compressed at the 'low' end and only when we get to the last LED is there a large difference in received level displayed by the indicator.

It would be nicer to see a bigger dynamic range here, however, the compressed scale syndrome is not particularly uncommon in CB rigs.

AM power output illuminates all five LEDs for the 3.5 watts RMS and on single sideband transmissions all the LEDs spring into life with fairly moderate drive level, well before the full output of 15 watts PEP is reached.

Transmitted and received audio frequency response is typically quite good for this type of transceiver and on air testing brought reports of good to very good transmission quality.

The lower row of rotary controls from left to right are:- on/off switch and Volume, Squelch, RF Gain and finally Clarifier.

What can I say about the Volume control? There is plenty of it and it sounds good. The Squelch is a bit slow to get started at about 2 micro volts and it requires a level of 1200 micro volts to bring the speaker to life at its maximum setting.

The RF Gain control has a range of 34dB which allows you to reduce the incoming signal strength by some 2000 times.

Many RF gain controls only offer a range of about 20dB which is sometimes not enough to eliminate the overload distortion produced by a nearby station. A high level of attenuation is essential if you are travelling in close 'convoy' with other operators.

The Clarifier has the typical plus and minus about 1 kilohertz frequency shift which allows the receiver to cope with the average frequency variations encountered on CB.

The rotary knobs all have an easily visible pointer which allows you to see at a glance exactly where each control is set. The pointers are actually moulded lugs that protrude quite noticeably from the circumference of the knob which makes operation of the controls in total darkness a real breeze. Such a simple, economical feature one has to be puzzled by its absence from most other rigs. I found it much better than back lit controls.

Row of slide switches directly above the rotary controls operates from left to right, the am/usb/lsb mode, the noise limiter and noise blanker, the virtually useless channel 9 priority function, and last but not least the CB/PA facility that offers a reasonable level of audio output to a separate speaker.

Finally, the far right hand side of the front panel holds the bright LED channel display and its associated 40 channel rotary switch.

The measured sensitivity of the receiver was very good showing 0.7 micro volts for 12dB SINAD on AM and better than 0.2 micro volts on both upper and lower sidebands.

Lifting the covers revealed a neatly designed, well laid out single sided circuit board that looked familiar, however, on further examination, while there are a number of similarities with another rig, the ST-901 proved to have sufficient originality to set it apart on its own.

The mechanical construction is strong with well machined, good quality materials used throughout.

Components are inserted in the board squarely and the wire straps are straight and neat. Soldering is very good throughout the transceiver and even the hand soldering is much better than many of the Korean manufactured rigs we have seen in recent times.

SUMMARY

The new Pearce Simpson ST-901 am/ssb transceiver from Hatadi Electronics is undoubtedly the best CB from this company in years. The rig is strong and compact with a combination of good features and performance the equal of any of its competitors. It is expected to be fairly priced and probably a few dollars less than competitive models from other manufacturers. Should be good value for money. Highly recommended.

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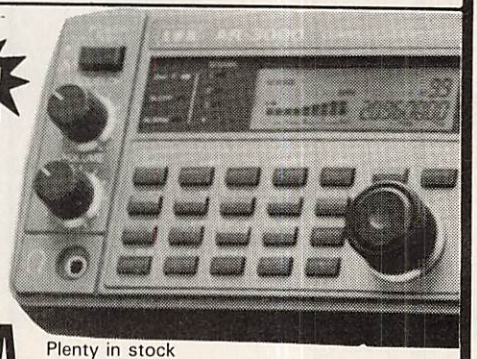

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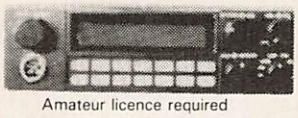

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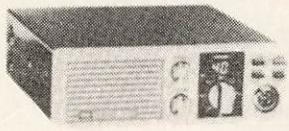

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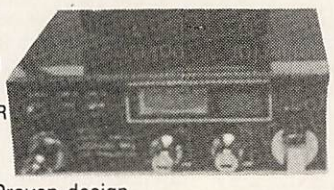

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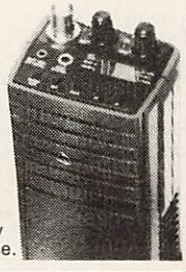

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scan

by Russell Bryant

FREQUENCIES, CODES and EVERYTHING ELSE YOU WANT TO KNOW ABOUT SCANNING

All frequencies are FM and all times are local, unless stated otherwise.

SIMPLY SIMPLEX

Since it's introduction for use by commercial two way radio in the early '70s, UHF has always been thought of as the home of the repeater. For extensive long distance communications, repeaters are the only effective way of covering large areas. However, not all UHF licensees need a repeater to service their capture area. The propagation effect of non-repeater UHF was grossly under-rated two or so decades ago. Ridicule along the lines of, "can't talk beyond the end of your street with it," was common. Most, if not all sceptics, including yours truly, have been converted. Contacts on UHF CB have put to rest any doubt held by the "HF or nothing" brigade. Both the users of the UHF land mobile allocations and the licensing authorities have recognised a number of advantages in using the mode without relying on a 50W repeater. Simplex, while not unique to UHF, has definitely found a niche amongst the power house repeater stations.

WHY SIMPLEX?

Apart from being spectrum efficient, a UHF simplex network is also cost effective when compared to setting up a repeater system.

So who uses simplex?

Everyone from government departments and small business to large national and international corporations.

Many simplex stations can operate on the one frequency without causing interference to each other. Provided the base antenna is not mounted to high, it is only necessary to have a few suburbs separating licensees.

Throughout the UHF land mobile allocations, certain frequencies and bands of frequencies, have been set aside for the use of services requiring simplex operations. These simplex channels are generally 'buffer zones' between the repeater channels.

POWER DOWN

Scanning simplex is an entirely new ball game. The majority of users of simplex frequencies employ handheld equipment, rated at around 5 watts output. If a base radio is used the power is 'wound down' from 50 watts to 10 to 15 watts and sometimes power as low as 5 watts is just enough to cover the desired area.

Therefore, it is not often possible to sit back in your shack and listen in on transmissions emanating from hundreds of kilometres away.

While I say not possible, I must also state that directional antennae such as Yagis, quads and log periodic type aerials can help to capture low power simplex stations.

When it comes to receiving, it doesn't matter if it is a Yagi designed for ham or UHF CB work, it will still pull in the signals.

WHAT AND WHERE

UHF simplex stations start almost at the beginning of the UHF land mobile allocations and occur every 10 MHz or so up the band. Down around 410 MHz, any rail buff can rattle off a dozen or so simplex channels used for yard and shunting work throughout Australia. The next major group of simplex is in the 450.000 MHz band, followed by 469.000 MHz, then 471.000, 474.000, 476.000 UHF CB, 484.000, 494.000, 509.000 and finally the 519 MHz band.

The above bands are the 'norm', the convention, however, does not always go according to plan.

For example, you are the licensee of a frequency pair, one for input to the repeater, the other as the output. You ring your local friendly radio supplier to order your radios and he asks if you would like "talk around" installed. "Talk around?," you ask. Your supplier reveals that talk around is simply the repeater output frequency, programmed into the radio as a simplex channel. It enables cars to monitor the base as well as communicate with each other over short distances without annoying the base operator.

Almost immediately it becomes obvious that any UHF frequency can be used simplex in one form or another, however, for the purposes of the exercise we will stick to the established allocations.

As a result of a reorganisation of the 400 MHz band in 1988, the following are the frequencies set aside for 'Single Frequency Services and Land Mobile Service-Simplex';410.550-412.450, 450.000-450.500, 469.500-470.000, 474.800-475.200, 476.425-477.400 (UHFCB), 484.800-485.200, 494.800-495.200, 509.525-510.000 and 519.525-520.000.

CALLING ALL SHIPS

In the maritime mobile service the frequencies 457.525, 457.550, 457.575, 467.525, 467.550 and 467.575 are used for on-board communications. These are simplex frequencies and limited to 1 watt on a non-interference basis. Unless you are on-board or extremely close to the vessel, very little will be heard.

WHO?

Some of the most obvious candidates as users of a UHF simplex frequency are, hospitals, shopping centres, industrial plants, television stations, sporting organisations, survey companies and movie productions groups.

Starting with the last first, movie and television location shoots can crop up anywhere.

Many years ago I worked in the film industry and was involved in the production of some of Australia's largest cinema greats, like, The Odd Angry Shot, Gallipoli, Breaker Morant, Mad Max 1, The Year of Living Dangerously and more recently the television mini series Dirt Water Dynasty.

In each and every case on set comms was via UHF simplex channels 494.800, 495.050 and 495.175 MHz. These are Australia-wide allocations and used extensively throughout the industry.

Shopping centres are mini communities, sometimes covering a dozen blocks. Communications with security, cleaning, parking control and administrative personnel is essential.

A low power base, (10-15 watts), controlling a number of handhelds is the ideal way to deploy staff as and when required. In New South Wales the largest shopping centre group is Westfields with stores at Burwood, Chatswood, Figtree, Hornsby, Liverpool, Miranda, Parramatta and Warrawong with all being allocated 469.500 for internal communications.

Westfield Doncaster (VIC) use 469.650. In Queensland 484.800 is employed at Indooroopilly, Strathpine and Toombul. Two simplex channels can be monitored in South Australia, 469.700 and 469.975.

Sporting events, especially football, receive a good deal of attention in Australia and are the perfect spot to find UHF single frequencies in use.

Communications between coach and players at football games irrespective of the code can be interesting as well as X rated. Rugby league occupies the minds of many New South Welshmen and women. Clubs such as Penrith (469.625), North Sydney (475.000 and 475.125) and Eastern Suburbs (471.475) have dedicated frequencies assigned. Other clubs, including Cronulla and Gold Coast use UHF CB channels.

Football is not the exclusive domain of UHF simplex; the Racing Drivers Association of SA has 469.700 MHz for administration work around its courses.

Those who tend and manage the hallowed turf of the Melbourne Cricket Ground do so on 450.025 MHz. Motor racing competitorJohn Goss, has two frequencies allocated - 484.500 in Brisbane and 484.875 MHz elsewhere.

One simplex channel that doesn't conform to the rule outside the posted bands is 467.075 which is used for NASCAR comms, but only within the limits of the track.

Cost is the motive behind commercial organisations employing

UHF CB for comms in and around their premises.

Handhelds form the majority of equipment used by commerciualk simplex services and because any number from one to a dozen are required it can be an expensive exercise.

The average commercial portable radio sells for a thousand dollars or more, while UHF CB handhelds can be bought for under $400. In Sydney for example, the Koala Park in the city's northern suburbs uses 476.900 MHz or channel 20 within the Park. Likewise, Featherdale Wildlife Park can be monitored on 477.400 MHz or channel 40. The trend toward UHF CB is not just a Sydney one, check out the action in your area.

Thee above are but a few of the hundreds of users of the simplex channels scattered about the UHF land mobile band.

Think of a group, company or government instrumentality and chances are they have a simplex allocation.

Law enforcement, rescue and life saving organisations, fire fighting groups, park rangers and even the defence forces can provide the scanner user with interesting radio traffic. If you suspect a licensee is using UHF simplex, program in the limits listed above and start searching.

Remember, some of these people are under the misapprehension that radio waves can't go beyond their boundaries. We know different, don't we.

MAIL BAG

BACK CHANNELS?

Michael, Fairfield NSW writes that he is new to scanning and would like some help in finding two NSW police channels referred to as 'back channels'.

Also could I list the four networks used by VKG, as mentioned in a previous issue of the magazine. The term 'back channel' is a hangover from the old days when two channels were set aside for rego/licence and warrant checks, commonly referred to a back enquiry.

Even though the channels are no longer used for such purposes, the name has stuck. The channels were 468.775 (38) and 469.125 (52).

These frequencies are now called special operations channels.

The only back channel remaining within Sydney is 467.850 (1) at Penrith.

The three networks I mentioned were the HF 0 - 30 MHz, VHF mid 84 MHz, VHF high 167 MHz and UHF 468 MHz. Depending on where you are in the state depends on the radio you use.

A RANGE OF FREQUENCIES

Tom, East Hawthorn VIC is seeking the frequencies used by the Army for range control around Puckapunyal.

I have several VHF lowband channels for the area you mentioned, and they are, 30.1, 30.3, 30.7, 30.9, 31.5, 34.25, 37.5 and 54.8. It is possible that these frequencies may have changed, however, the new allocations will not be far from the old one. A little bit of searching will find the answers.

BLACK THUNDER RIDES AGAIN

Matthew, Reynella SA says the frequency he supplied in a past issue for Blackthunder was wrong and that it should have read 486.500, not 485.600 as given.

He also states that airband comms can be monitored on non-airband receivers.

By taking the airband frequency and adding the image, or twice the IF of the receiver to it, a fair signal can still be copied.

Because you are listening to AM on FM the signal will be a bit distorted. Matthew has included a list of CFS channels and frequencies, CH.1 163.63 State HQ, CH.2 163.12 State HQ, CH.3 163.290 State HQ, CH.4 163.3 Mitcham Hills, CH.5 163.21

CONVERTING THE FRG 9600

Martin, Townsville QLD recently purchased a Yaesu FRG 9600 receiver and would like to fit a converter to it to cover the HF bands.

There are several 'UP' converters available that will do the job. By converting the HF signal to a VHF one they resolve sideband, (especially with the FRG), very well. I had a converter fitted to my FRG 9600 and was very happy with the result.

Andrews Communications of Sydney is where I obtained it, you should contact Lee on 02 344 7880 for details.

DISCOVERING THE DISCONE

Steven, Jannali NSW wants to connect his PRO 36 to an external aerial and is considering a discone. His main area of interest is the Police, Fire and Ambulance services and he would like to hear all cars and appliances within the Sydney area. Steven, the PRO 36 will seem like a new radio with the use of a DISCONE or any other external aerial you decide on. However, the fire brigade and ambulance use VHF simplex frequencies, (that is the same frequency for transmit and receive), unless you are close to the car you will not hear all mobiles Sydney wide. The police are a different story as they use repeaters, thereby extending the range of their communications.

ALL AT SEA

Thirteen year old Tim, East Gippsland VIC checks in with some frequencies for the vessels that ply the waters of Bass Strait. The Seacat can be copied on 469.725 simplex and the Abel Tasman on 473.800 and 474.100. Tim requested the frequencies for the RFDS and while they're a little outside my area here they are as follow:

VJD Alice Springs 2020 4350 5410 6950,
VNZ Port Augusta 2020 4010 5145 6890 8165,
VJC Broken Hill 2020 4055 6920,
VJN Cairns 2020 2260 4880TX/4926RX 5145 5300 6785RX/6866TX 7465,
VJJ Charleville 2020 4980 6845 7307TX/7410RX,
VJI Mount Isa 2020 5110 6965 7392TX/7475RX,
VJT Carnarvon 2020 2280 4045 6890,
VKL Port Hedland 2020 2280 4030 6960,
VKJ Meekatharra 2020 2280 4010 4880TX/4926RX 6880 7517TX/8147RX,
VJB Derby 2020 2792 5300 6925,
VKF Wyndham 2020 2805 5300 6945,
VJQ Kalgoorlie 2020 2656 5360 6825 7550TX/8144RX,
VIO Broome 2760 4940,
VIH Hobart 5355,
VJY Darwin 2020 4010 6840 6975.

These HF frequencies can generally be received across the country. The following VHF/UHF channels are for local comms only:

70.130 Cairns, Charleville, Mt Isa,
129.600 West Australia,
158.230 Derby, Wyndham,
159.730 Broken Hill, Alice Springs, Port Augusta,
166.030 Port Augusta,
169.270 Port Hedland,
469.450 Kalgoorlie,
485.200 Broken Hill.

BETTER LATE THAN NEVER

Last issue a reader from South Australia requested the frequencies used by the University of South Australia.

My reply was that I could not locate one. Richard Barrett from ESG has advised me that the SA College of Advanced Education and the Institute of Technology merged to form the SA University.

The frequencies licenced to them are 463.325, 519.500 and 519.650.

Also included in that answer was the 'K' codes used by the Metropolitan Fire Service. The MFS changed their codes a while back, I listed the old ones.

The correct MFS codes are:

K0=Not available to respond,
K1=Mobile to incident, K2=Arrived backup at scene,
K3=At incident available to run,
K4=Mobile and available in home area,
K5=Off and clear at home station, K6=Available in area...,
K7=At station..., K8 (appliances)=delayed response,

(continued over page...)

CONTINUED FROM PRIOR PAGE.....

K8 (on call staff)=available at home,
K9 (appliances)=Vehicle unattended, K9 (on call staff)=On pager,
K10=Activate Hyperbaric chamber, K11=Ambulance required,
K12=ETSA required, K13=SAGASCO required,
K14=Police required (reason),
K15=Fire Cause Investigator required,
K16=SES required (reason), K17=CFS required (reason),
K23=Specialist advice required,
K24=Dangerous goods info required,
K24-2=Dangerous goods info to follow,
K25=Unable to proceed (reason), K26=Proceed to & stand by at...,
K27=Arrived at..., K28=Not required, return to station,
K29=Return other appliances, K32=Request installation status,
K32-2=Installation normal, K32-3=Installation in alarm mode,
K34=Details to follow, K35=Request map reference,
K36=Verify address, K37=Change to channel, K38 Initial control,
K38-2=Initial control centre, K38-3=Incident control centre,
K39=Change of command (state name), K40=Bomb Alert,
K41=Fatality/ies, K42=Persons reported,
K43=Persons accounted for,
K44=Appliances involved for extended time,
K45=Appliances still involved, K46=Relief crews required,
K55=Special service incident, K66=Rubbish grass etc,
K77=Nothing showing, K88=Property fire small,
K99=Property fire well involved.

All stop messages are given in plain speech. Thanks to Jeff and the other readers who brought the error to my attention.

MORE ON THE FRG 9600

Brian, Timaru NZ asks if there are any mods for the FRG 9600 receiver.

He would like to scan and search faster, stop and hold for the duration of the transmission rather than the annoying habit it has of resuming mid sentence and finally he would like reception of frequencies below 60 MHz.

There is nothing that can be done as far as the first couple are concerned . There have been a number of HF converters available for the FRG 9600, however, with Kuranishi one of them. This is Imported by Andrews Communications of Sydney,

I suggest you give them a ring or drop them a line for details. As to the noise the IC R 100 makes when jumping large gaps in frequencies, I would say the local agent is correct, the scanner is switching levels within the front end of the receiver and the noise is the difference in noise associated with the different bands.

VIC AMBOS

Neville, Geelong VIC would like to know where the Geelong Ambulance has moved to.

As a guess I would say they have switched, along with Melbourne, to the new national allocations for ambulance services. The frequencies for the medicos are 412.475, 412.500, 412.575, 412.650, 412.750, 412.850, 413.025, 413.075, 413.100, 413.125, 413.150, 413.175, 413.225, 413.275, 413.350, 413.375, 413.425.

A scan of these channels should reveal their new location.

MILITARY-POLICE

Jason, Runaway Bay QLD hasn't been able to receive or locate the Queensland Police VHF channels with his Bearcat 200 XLT. The VHF numbers are; ch.41 77.540, ch.42 77.420, ch.43 77.480, ch.44 77.510, ch.45 77.450, ch.46 77.570, ch.47 77.495, ch.48 77.375, ch.49 77.330, ch.50 77.345, ch.51 76.400, ch.52 76.430, ch.53 76.490, ch.54 76.355, ch.55 76.520, ch.56 76.550.

Jason also asks for any military frequencies for the Gold Coast area of the state. Some possibilites are:

30.100, 30.300, 30.700, 30.900, 31.500 Range control Canungra,
35.350, 41.900, 42.150, 46.360, 49.700 Army mobile to mobile,
43.550, 60.350 air to ground Oakey,
73.550, 76.820, 78.040, 79.000, 79.240, 79420 Army,
80.100, 149.200 Air Force Amberley,
149.180 Army Fire Service,
156.475 HMAS Morton.

SCANNING WITH A PRO

Alan, Morphett Vale SA uses a Realistic PRO 2022 to scan his area. Here are a few of his favourite services.

The SA Sea Rescue Squadron can be heard on 488.750 most weekends. For some lighter moments, check out the local taxi channel 489.175, together with the Royal Automobile Association frequency 488.275.

Can the frequency range of the 2022 be extended by modification? At this stage no.

WHAT'S THE CHARGE OFFICER?

Don, Bicton WA has acquired a Bearcat 100 XL and charger and would like to know how long to charge the internal battery pack. How long is a piece of string? Much depends on the state of the cells. From dead flat, anything up to 16 hours may be required. In a semi discharged condition a few hours will generally top them up. It is a good idea to discharge the nicads completely and charge for at least 12 hours. Once a battery pack has been charged to capacity, any excess is given off as heat, if they are hot, they are charged.

EXTRA QLD FIRE CHANNELS

Greg, Brisbane QLD questions an item in a past article by Bob Lopaka regarding the number of channels in use by the Queensland Fire Service. The article by Bob referred to nine channels, yet after a conversation with a fire fighter he believes they have twenty two channel radios.

He would like to know the frequencies for the MFB in Brisbane.

They are:
1.466.850 South Brisbane,
2.466.925 Central Brisbane,
3.467.325 North Brisbane,
4.466.875 Fire Ground,
5.466.975 Fire Ground,
6.467.675 Maroochy,
7.467.575 Caboolture,
8.467.350 Ipswich,
9.467.800 Sunshine Coast and Toowoomba,
10.466.950 South Coast and Pine Rivers,
11.467.500 South Coast.

The first eleven channels are repeater, the second eleven are simplex using the output of the repeaters, which are the frequencies listed above.

LOOK UP IN THE SKY

The Secret Republican, NSW has monitored the Careflight Helicopter on the following hospital channels:

487.175, 487.200 Royal North Shore,
488.900 Blacktown,
488.950 Westmead,
489.000 Royal Prince Alfred.

He has also heard Lifesaver helicopter on 489.225.

All choppers use ambulance frequency 76.670 channel 1 for liaison.

PROPAGATION

A couple of years ago a friend of mine put together the PROSCAN kits for converting the Tandy PRO 2004 to 2005 status. That friend is alive and well and living in America, however, before he left he stored his remaining stocks in my office.

I have decided to clear some of the excess junk from the area, including the left over kits. If anybody is interested, the kits are $5.00 each including postage, the keyboard overlays are $1.50 each or six for $5.00 both including postage.

Just drop me a line at the address given, so I can get rid of these things and use the space, please.

NEW VIC FREQUENCY REGISTER

Back in the 'good ol days', frequencies were treated with a degree of respect. It took so long to find out who owned them that you never ever gave them away.

Because of the artificial status given these magic numbers many

selfishly refused to part with their finds under any circumstances.

Today it is a different story, frequency guides abound, some good, others no so good. Having just finished scanning, (pardon the pun), The Ultimate Scanner Frequency Register for Victoria, I must say it is one of the best. The USFR is of A4 size and runs to over 170 pages, each packed, not only with frequencies, users and DoTaC callsigns but also individual emergency service callsigns and radio codes. Somewhat of a departure from the norm is a brief, but nevertheless detailed explanation of 'choosing the right antenna', 'harmonics and birdies' and 'trunking', all things that effect scanner users. The listings are in alphabetical order with the TX and RX frequency, to whom the frequency is allocated, their official callsign, type of business together with the town or location of the transmitter and the power emission, be it low or high.

The USFR covers all emergency services, security groups, media organisations, taxis, aircraft, marine and thousands more. Compiled by Michael Evans from Scan Victoria, The Ultimate Scanner Frequency Register is well worth the $25.00 or so asking price. Orders and enquiries should be directed to *SCAN VICTORIA, PO Box 624, Hawthorn, VIC 3122.*

VISOR-CODE WINNERS

While on the subject of frequency lists, the winners of the six VICPOL Visor-code cards should have received their prizes by now. Sorry to those who missed out. Stay tuned for future releases of these excellent products.

TALKING BILLBOARDS

Not only are your eyes assaulted by roadside advertising billboards, but also your ears.

Low power transmitters have been installed at selected boards throughout capital cities.

By tuning your car's FM receiver to 99.9 MHz you get a run down on the product being advertised. For scanner owners the reception mode is WFM. The frequency 99.9 MHz is also being used by other low power services.

The announcers at Parramatta Speedway broadcast the action to those people in the crowd armed with 'Walkman' type radios.

If your local drive-in has wireless speakers, then checkout 99.9 it may be in use for audio delivery.

THE LAST WORD

The response to my article, 'The Australian Government to Ban Scanners' certainly caused a flutter among those who read it.

After the initial shock to the cardio-vascular system, all commented on the fact that we are the 'lucky country'.

The 'War of the Worlds' format highlighted the draconian laws that are in place in other seemingly open-government countries.

While statutes exist in this country limiting the monitoring of telephone conversations, we a free to carry on our hobby unrestricted.

Under NO circumstances are we likely to be gaoled for mere possession of a scanner. It is therefore imperative that we do nothing to bring ourselves, the hobby or the equipment to the adverse notice of the legislators.

That is, if we wish to continue to monitor unaffected by the law, we must be seen to be law abiding.

Some readers have noticed two postal addresses for the column. The one to write to with frequencies, questions or whatever is;

SCAN
PO BOX 344
SPRINGWOOD NSW 2777

QUEENSLAND CB RADIO CENTRE

ROJONE

10 dB Base Antenna $240
6 dB Mobile Antenna $50
RG 213 A-L-L..... from $3.90m
RG 58cu..... from 75c/m
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5ft Blue Mobile Antenna.....$11.80

GME | Electrophone:::

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5/38 BLACKWOOD ROAD

WOODRIDGE QLD 4114

PH/FAX: (07) 808 8197

MESSAGING: (07) 241 1337 (24H)

FULL WORKSHOP FACILITIES AVAILABLE

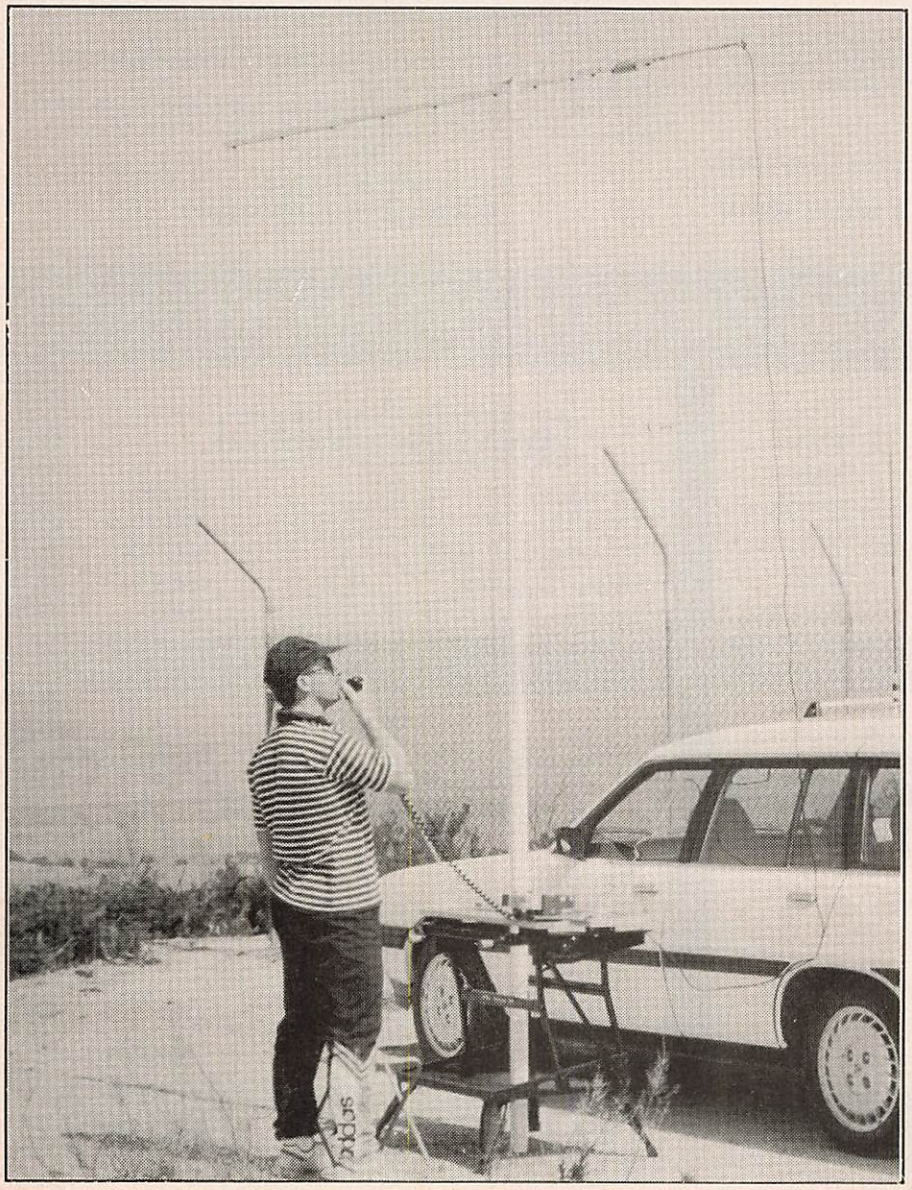
Craig Johnson and mates prove that when it comes to UHF

Height is might!

Anyone who has been around UHF radio for a while soon realises how important it is to locate an antenna as high as practically possible to maximise signal coverage.

The "line of sight" principle virtually means that a UHF signal can travel unaffected over a great distance, providing there are no obstructions to hinder its passage along the way. There are even some occasions when a signal can be heard over even greater distances due to a phenomenon known as inversion or "dusting", where a signal can be carried over vast distances on warm air currents, but as with 27mhz "skip", this is determined by atmospheric conditions and, as such, is not very reliable.

With all this in mind, a dedicated (or should that read crazy?) group of UHFers, myself among them, set out to find over what distance a signal could be heard if the transmitting sites were all located on mountain tops, with little or no obstruction along the signal paths, and if there were no inversion present.



Over several months (the winter ones to be exact) many sites were discussed, topographical information gathered and some of the favoured locations surveyed. Finally, in late September, the final sites and persons who would journey to them had been sorted out as follows:

* Mt William (30kms west of Ararat)-Greg (VCE 173)
* Mt Buller (35kms south east of Mansfield)-Jeff (VCE 402)
* Mt Wombat (15kms south east of Euroa)-Craig (VAB 196)
* Mt Buninyong (10kms south of Ballarat)-Alan (VGG 437)
* Mt Macedon (50kms north of Melbourne)-Brian (VAB 165)
* Mt Alexander (20kms south of Bendigo)-Peter (VCP 833)
* Melbourne base-Tom (VAT 674)

Anyone interested in perusing a map will see that some of these locations are situated between two others, the reason being that we are unsure of whether our signals will be able to cover the total distance between the sites that are furthermost from each other. Also, it was decided to have a Melbourne base (Tom) in case anyone has any mishaps whilst enroute. Tom would then contact Brian at Mt Macedon who should, in theory, be able to contact most of the other participants and advise them of any problems.

So with the details sorted out and all likelihoods covered (please leave us alone Murphy!), we set out for our respective locations on the morning of 2 November 1991.

All stations were expected to be on site by midday which meant leaving Melbourne at different times. Most of us were able to drive all the way to our sites, with a few exceptions. Greg had a walk of approximately 2kms, lugging all his gear, to get to a suitable position on Mt William, and while Jeff's walk at Mt Buller wasn't as far, it was very steep and over the last one hundred metres he was mumbling something over his handheld about stumbling through ankle deep snow in places!

Craig (VAB 196) "at the desk" on Mt Wombat. The equipment consisted of a Sawtron 999, IC-40G and Powerband PB-11E yagi.

TOP: Jeff (VCE 402) operated from Mt Buller using identical equipment to Craig while
(BELOW) Greg (VCE 173) operated from Mt William using a Philips FM620, twin 14 element yagis, scanner and cellular telephone.

By the time midday had arrived, most of us had our beams and radios working, and some contacts had already been established. I was able to talk to both Jeff on Mt Buller and Brian on Mt Macedon, on my Icom IC40G handheld set on low power (about 800 milliwatts) with the standard quarterwave antenna, a distance of 76 kms and 112kms respectively.

By now everybody was in position, messages were being relayed across mountain tops to the two furthest points and beams were lined up. All stood by listening intently...nothing heard at Jeff's end, a quick check with Alan on Mt Buninyong to verify whether Greg had been transmitting....yes, all ok down at Mt William. Messages were again relayed and beams were carefully realigned, all stood by....suddenly the speakers on both Jeff's and my Sawtrons came to life!, we could hear Greg!, the signal was scratchy and fading but readable. Jeff fired a signal back to Greg and the two of them conversed for a short time, both very pleased and rightly so. They had just made a 345km simplex contact across Victoria, without the aid of any inversion! The exercise was pronounced a resounding success. With the main contact firmly established the rest of the stations had their turn to try for some of the others.

The results of the exercise are as follows:

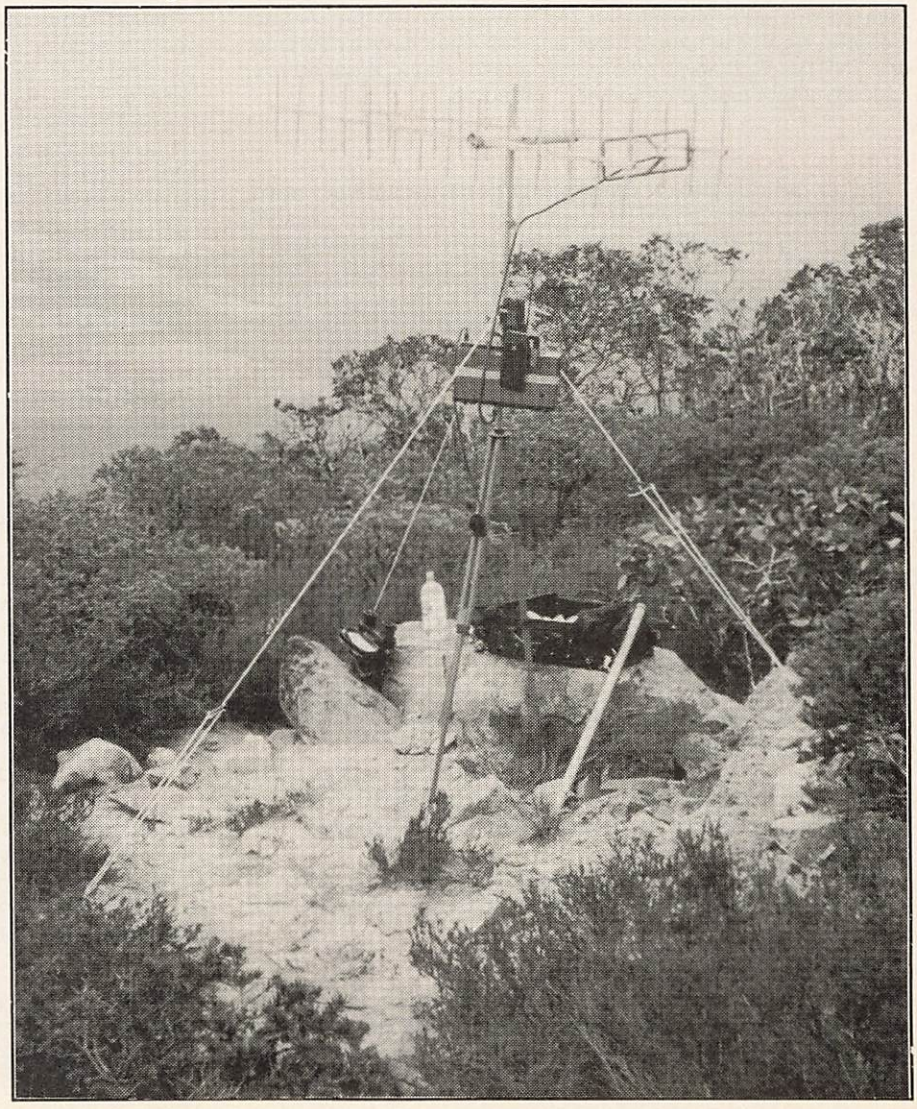
*** Mt Buller to Mt William 345kms**
*** Mt Buller to Mt Buninyong 222kms**
*** Mt Buller to Mt Alexander 191kms**
*** Mt Buller to Mt Macedon 165kms**
*** Mt William to Mt Wombat 277kms**
*** Mt William to Mt Macedon 177kms**
*** Mt William to Mt Alexander 156kms**
*** Mt William to Mt Bun'yong 125kms**
*** Mt Wombat to Mt Bun'yong 178kms**
*** Mt W'bat to Mt Alexander 122kms**
*** Mt Wombat to Mt Macedon 112kms**

(note, all distances of less than 100kms are not listed but were easily achieved).

As can be expected over these distances, there were many other stations on the frequency that our group was using. We took on several breakers from all over Victoria and to them as well as the other groups using the channel I thank you.

Your patience and courtesy during several hectic hours contributed to the success of this exercise. Finally to all the UHF operators out there who read this, remember when this band was allocated to us there was no such thing as commercial operators cluttering up the channels. UHF was a logical extension to 27mhz citizens band radio, for Joe average to have a chat with his friends and to also make new ones.

Next time you are sitting there in your chair, waiting for the commercial operators to have a break so you can put a call out, why not consider getting your group of operators together and give something like this a go. After all there are still a lot of mountains out there !



bandspread

FROM DC TO DAYLIGHT *with Greg Towells*

Welcome to more of Bandspread. This column covers items of interest from all areas of radio. I need to know what it is that you the reader wants to see in this column, so write to P.O. Box 577, St Marys, NSW, 2760.

A number of readers have expressed interest in packet radio. I have compiled some of the most often asked questions (by no means every question that newcomers ask!) and answers on the fascinating subject of Packet Radio.

Firstly, packet radio is a mode that can only be used as a means of communication by licensed Limited or Full Call radio amateurs, so this is yet another incentive to upgrade to the ranks of radio amateurs.

Packet radio basically is a means to connect computers together by means of radio rather than by telephone or other type of cable. Information, text, computer programs can be passed from one computer to another via an interface to a radio called a TNC.

Next issue I will delve into the TNCs available and the frequencies where you can tune to hear (and see if you have a computer and TNC) packet radio traffic being passed. Have I aroused your curiosity about packet radio yet?? Read on.

What is packet radio?

Packet radio is digital communications via amateur radio. Packet radio takes any digital data stream and sends that via radio to another amateur radio station. Packet radio is so named because it sends the data in small bursts, or packets. Packet radio then, is a way of connecting and sending data between computers using the airwaves as the connecting medium rather than telephone cable.

Why packet over other digital modes?

Packet has one great advantage over other digital modes : automatic operation. Packet TNCs are very advanced as far as automatic control goes. Just simply connect to the other station, type in your message, and it is sent automatically.

Any packet TNC can be used as a packet relay station, or a digipeater.

This allows for greater range by stringing several stations in a row. On HF, this allows for contacts with stations normally not in propagation range. Packet radio provides error-free transmissions because of built-in error detection schemes. If a packet is received, it will be correct.

Also, on VHF/UHF packet, packet operators are allowed to operate in automatic control mode. This means that you can leave your packet station on constantly.

Other users can connect to you at any time they wish to see if you are home. Some TNCs even have Personal BBSs (sometimes called mailboxes) so other amateurs can leave you messages if you are not at home.

Another advantage of packet over other modes is the ability for many users to be able to use the same frequency simultaneously.

What elements make up a packet station?

A TNC (Terminal Node Controller).

A TNC contains a modem to decode the audio signals into digital signals. It also contains a micro-computer handle to convert the digital signals into text that can be sent over a RS-232 port to the computer. The CPU also handles the protocol overhead of the packet station. When you send data, it takes the text, puts error checking on it (CRC) and also puts it in an envelope for sending. When receiving a signal, it takes it out of the envelope, and sends the message to the computer.

Computer or Terminal

This is the user interface. A computer running a terminal program or just a dumb terminal can be used. For computers, any phone modem communications program can be adapted for packet use or customized packet radio programs are available.

A radio

For 1200-baud operation (normal user access), a standard voice radio can be used. For UHF or VHF packet, narrow band FM is used, normally on simplex channels. For HF packet, 300-baud data is used over single sideband modulation.

What do you mean we can all use the same channel?

Packet radio uses a protocol called AX.25. AX.25 specifies channel access (ability to transmit on the channel) to be handled by CSCA/CD (Carrier Sense Collision Avoidance/Collision Detect) If you need to transmit, your TNC monitors the channel to see if someone else is transmitting.

If no-one else is transmitting, then the radio keys up and the TNC sends its packet. All the other stations hear the packet and do not transmit until you are done.

Unfortunately, two stations could accidentally transmit at the same time. This is called a collision. If a collision occurs, neither TNC will receive a reply back from the last packet it sent. Each TNC will wait a random amount of time and then retransmit the packet again.

What is AX.25 ?

AX.25 (Amateur X.25) is the communications protocol used for packet radio. A protocol is a standard for how two computer systems are to communicate with each other, somewhat analogous to using business format when writing a business letter.

AX.25 was developed in the 1970s and based of the wired network protocol X.25. Because of the difference in the transport medium (radios vs wires) and because of different addressing schemes, X.25 was modified.

AX.25 also included a digipeater field to allow other stations to automatically repeat packets to extend the range of transmitters. One advantage of AX.25 is that every packet sent contains the sender's and recipient's amateur radio callsign, thus providing identification with every transmission.

Are there any other protocols in use other than AX.25?

AX.25 is considered the defacto standard protocol for amateur radio use and is even recognized by many countries as a legal operation mode. However, there are other standards. TCP/IP is used in some areas for amateur radio. Also, some networking protocols use other packet formats than AX.25.

What is TCP/IP?

TCP/IP stands for Transmission Control Protocol/Internet Protocol. This is commonly used over the Internet wired computer network. The TCP/IP suite contains different transmission facilities such as FTP (File Transfer Protocol), SMTP (Simple

Mail Transport Protocol), Telnet (Remote terminal protocol), and NNTP (Net News Transfer Protocol).

The KA9Q NOS program (also called NET) is the most commonly used version of TCP/IP in packet radio. NOS originally was written for the PC compatible.

However, NOS has been ported to many different computers such as the Amiga, Macintosh, Unix System V, and others. Smaller computers like the Commodore 64 and the Timex-Sinclar do not currently have a version of NOS available.

Networking Schemes

What are some of those other networking schemes?

During the early days of amateur packet radio, it became apparent that a packet network was needed. To this end, the following packet network schemes were created.

Digipeaters

The first networking scheme with packet radio was Digipeaters. Digipeaters would simply look at a packet, and if its call was in the digipeater field, it would resend the packet. Digipeaters allow the extension of range of a transmitter by retransmitting any packets addressed to the digipeater.

This scheme worked well with only a few people on the radio channel.

However, as packet became more popular, digipeaters soon were clogging up the airwaves with traffic being repeated over long distances.

Also, if a packet got lost by one of the digipeaters, the originator station would have to retransmit the packet again, forcing every digipeater to transmit again and causing more congestion.

KA-Nodes

Kantronics improved on the digipeater slightly and created KA-Nodes. As with digipeaters, KA-Nodes simply repeat AX.25 frames. However, a KA-Node acknowledges every transmission each link instead of over the entire route.

Therefore, instead of an end-to-end acknowledgement, KA-Nodes allow for more reliable connections because acknowledgments are only carried on one link.

KA-Nodes therefore are more reliable than digipeaters, but are not a true network. It is similar to wiring your own telephone network to make a phone call.

NET/ROM

NET/ROM was one of the first networking schemes to try to address the problems with digipeaters. A user connects to a NET/ROM as if connecting to any other packet station.

From there, he can issue the NET/ROM commands to instruct it to connect to another user locally or connect to another NET/ROM.

This connect then connect again means that to a user's TNC, you are connected to a local station only and its transmissions do not have to be digipeated over the entire network and risk loosing packets. This local connection proved to be more reliable.

NET/ROM don't use all of the AX.25 protocol.

Instead, they use a special AX.25 packet called Unnumbered Information (UI) packets and then put their own special protocol on top of AX.25. This is again used to increase efficiency of the transmissions.

NET/ROM is a commercial firmware (software put on a chip) program that is used as a replacement ROM in TAPR-type TNCs.

Other programs are available to emulate NET/ROM. Among them are TheNet, G8BPQ node switch, and some versions of NET.

NET/ROM nodes, at regular intervals, transmit to other nodes their current list of known nodes.

This is good because as new nodes come on line, they are automatically integrated in the network, but if band conditions such as ducting occur, often unreachable nodes are entered into node lists.

This causes the NET/ROM routing software to choose routes to distant nodes that are impossible.

This problem requires users to develop a route to a distant node manually defining each hop instead of using the automatic routing feature.

ROSE

Rose is another networking protocol derived from X.25. Rose nodes have a static list of the nodes that can be reached. For a user to use a ROSE switch, he issues a connect with the destination station and in the digipeater field places the call of the local rose switch and the distant rose switch the destination station can hear.

Other than that, the network is completely transparent to the user.

The static routing tables ROSE uses, ensure that packet routing does not use unreliable links such as NET/ROM suffers from. However, ROSE suffers from its inability to change its routing table as new nodes come on line.

The operator must manually change every routing table, thus ROSE networks require greater maintenance times.

Thanks to Marc and many others for their interest in packet radio, and hopefully more than a few of you will be sorely tempted to study up and gain an Amateur radio ticket.

Things are going ahead in leaps and bounds in the packet radio field, the main area of amateur radio in which the radio and the computer enthusiast meet in a big way.

If you have an interest in radio and computers, then Packet radio is for you.

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Goodbye Morse Code!

THE NO-CODE NOVICE

The proposed new "no-code" ham ticket might be your fast-track into the world of amateur radio, reports David Flynn.

The Wireless Institute of Australia (WIA), Australia's representative body for amateur radio enthusiasts, recently announced their plan to introduce a new grade of amateur ticket, one which has quickly been tagged the "no-code novice" licence.

The new category will retain the existing multiple-choice examinations in radio theory and government regulations, however these are both pitched at a very basic level and should pose no problem to most radio enthusiasts.

What's missing from the mix is the need to send and receive morse code, something which has been a barrier to thousands of potential hams over the years.

The result is a "fast-track" into the world of amateur radio, and the no-code novice is tipped to create the biggest boom in amateur radio since the introduction of the original novice licence and the CB boom of the mid-70s.

What Do You Get?

Under the WIA proposal, no-code operators will be restricted to 146-148 Mhz. This is the upper half of the popular two-metre VHF band and the same segment as was granted to novices two years ago.

This 2 MHz-wide slot is where you'll find most of the two-metre action and all of the repeaters. The VHF repeater network is quite excellent in its scope and breadth of coverage. For the technically minded the repeater channels are spaced at 25 kHz with an offset of 600 kHz.

The only mode permitted will be FM, with a power output limited to 10 watts.

Background

The story behind the no-code novice goes back to the 1970s, so let's review developments to bring you up to speed on where we are now.

For what seemed like time eternal, Australia possessed two distinct classes of amateur radio licence - the full-call and the limited. Both required examinations in high-level theory along with international and local regulations.

The full-call also had the ability to transmit and receive morse at the speed of 10 words per minute. This last qualification gave them access to the full spread of amateur allocations whereas the limiteds were, as their name indicates, "limited" or restricted to bands upwards of 50 MHz (six metres) for their lack of code qualifications.

In a move which has been brewing for months - if not years, Australia seems set to drop the morse code requirement for amateur radio licences.

First Came The Novice

It was in the middle of the 1970s that CB threatened the order of things. Suddenly, people were using and enjoying the hobby of two-way radio without any technical knowledge.

They were also without licences, as CB was illegal at the time.

Many factions in the WIA petitioned against the legalisation of CB. Part of their strategy was to introduce an entry-level licence known as the "novice".

This was not only designed to capitalise on the new-found interest in radio communications, but to weaken the argument for a CB radio service by providing what the people wanted (at any rate, what the WIA thought they wanted) within the amateur radio service.

The novice sat for the same regulations component as the limited and full-call, an exam in basic radio-electronics theory, plus a morse code test paced at five words per minute. In return they were given access to segments of three HF bands with transmission modes limited to code, AM and SSB, all operated at a far lower power than the other licence grades.

Then Came The Controversy

The novice licence was the source of considerable controversy from within the ranks. Most opposition came from older amateurs who feared that the newer operators would result in an influx of CB-type operations. It's ironic that while these operators whinged and whined that ham radio was a dying hobby, they opposed the most obvious means to put new life into the bands. By any and all standards, the novice licence was a staggering success.

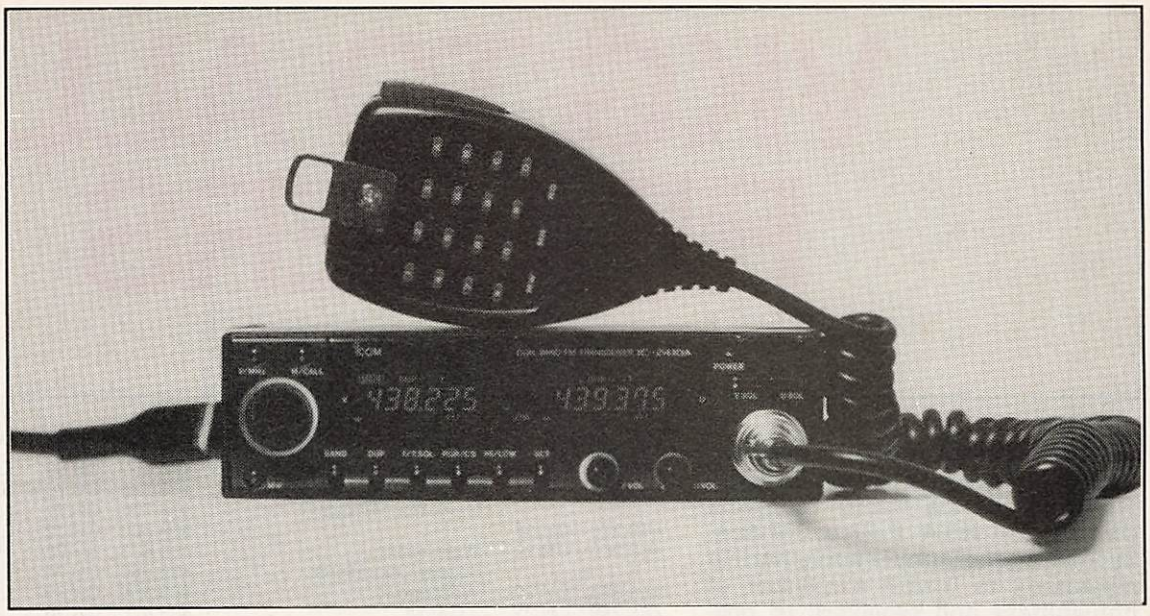
Novices injected new blood into the hobby, and it wasn't all the young blood the pundits expected - many novices were and remain to be drawn from that elusive 31-49 demographic, and some are even older (magazine editors included!).

However, the following years saw a trend even further away from tradition. Now that Australian amateur radio was starting to get back on its feet, one question arose - where to from here?

There were always doubts that mastery of morse was absolutely essential for conducting a conversation, experimenting with radio communications or simply enjoying a hobby. Within and without the service there were several pushes for a code-free licence, with the emphasis less on technical skills and more on using the radio as a hobby in itself. This proposed class became generically known as the "communicator" licence.

In more recent years, as the interest of youngsters turned towards computers, calls were made for tapping into the PC revolution and making digital or "packet" radio the basis of a new licence.

Although neither of these ideas ever found enough favor where it counts, they and the debate they encouraged have undoubtedly sown the seeds for the WIA's long overdue proposal.



To the right is the IC-2410A, a combined 2m/70cm mobile while bottom right is a handheld Standard 70cm rig.

Why Not More?

Many CBers are undoubtedly wondering why the no-code novice licence will restrict them to VHF when novices with code knowledge can use three HF bands at 3.5 MHz, 21 MHz and 28 MHz to gain worldwide coverage.

Those familiar with two metres might ask why the WIA wants to throw even more users onto the band and not allow them to help populate the UHF 70cm allocation.

WIA Backed Down

The WIA backed down from recommending HF due to the conception, a dated one in this writer's mind, that to operate on HF requires CW or code.

I have always failed to grasp the mystical, hidden relationship between a random bunch of frequencies and the need to master a primitive form of transmission pioneered over a century ago.

By basing the no-code licence on the novice category, the WIA also finds itself locked into an obvious moral argument that the no-code novice could not expect to be given anything more than their code-qualified comrades - thus, no additional VHF or UHF spectrum or modes.

This neatly locks the no-code novice out of all MF and HF amateur allocations and also blocks any hope of access to the fascinating VHF six metre and growing UHF 70cm bands.

What may yet come, and I stress "may", is access to the 70 cm UHF band at 420-450 MHz.

If this does eventuate, the no-code novice would be looking at a restriction to 430-440 MHz, home of repeaters and FM-only operation.

If the WIA can accept the reality of digital modes as a carrot, and can embrace the opportunities which packet presents to the hobby, then there might appear the far more attractive proposition of being able to hook that PC up to the radio and explore the joys of packet radio, wireless bulletin boards and "digipeaters".

What will all this cost? For those who equate amateur radio with the $1000-plus price tag of a "basic" HF base rig, which rapidly moves towards $3000 by the time you start talking all-mode and full-featured, VHF and UHF gear is surprisingly affordable, costing not much more than a UHF CB set or a new scanner.

Prices Start Around $250

Two-metre handhelds begin around $350, a level which offers around 2.5 watts FM output and 10 memory channels across the band. FM mobiles are on the blocks at $500 for high power (anywhere from 25-45 watts), multi-mode scanning and hot-to-trot receivers.

The big sellers are dual-band units which give you two metres and 70 cm in the one box, and this is one key factor in the argument for no-code access to 430 MHz. For under $700 you can bring home a twin-band handheld with cross-band duplex, memories, scanning and wideband receive. Another few hundred and you've got a mobile with all that plus more. The no-code licence will have an even greater effect, making the trade in two metres a true sellers' market.

In short, the WIA looks to be on a winner with the no-code concept. It will be even more successful with UHF and packet radio to sweeten the deal... stay tuned to CBA or our sister magazine Amateur Radio Action for further developments.

VKG TO ALL READERS

By Robert Peel

Unlike Melbourne or Adelaide, Sydney presents some unique problems for the Radio Technical Unit of the NSW Police Service. Sydney's geography is such that it is necessary to install a number of transmitters and receivers to provide the coverage needed. This process is known as voting.

Areas around the northern beaches and northern suburbs, together with the Blue Mountains to the west, are especially hilly, with many residents living in areas shadowed to high power television broadcasts, never mind the 50 watts output of the average police base.

Voting has been introduced to all but a handful of districts within the metropolitan area. By establishing several repeaters (voting), throughout a district, the strongest signal is always broadcast to the mobiles.

The only districts not covered by voting are A, F and M districts, all of which are covered by a single channel. The NSW Police plan to have voting installed in all districts when time and money allow.

The current NSW Police UHF channels are;

467.850	CH.1	J District, Back Enquiries
467.875	CH.2	
467.900	CH.3	E District, Thredbo, Cooma
467.925	CH.4	Sports Freq.2
467.950	CH.5	E District, Jindabyne
467.975	CH.6	
468.000	CH.7	G District
468.025	CH.8	J District
468.050	CH.9	S'thern Hi'lands X band, Bourke X band, Tamworth South X band, Newcastle City X band
468.075	CH.10	E District, Perisher
468.100	CH.11	Sports Freq.1
468.125	CH.12	
468.150	CH.13	Wollongong, N'castle to Tamworth link, North Coast X band, Queanbeyan
468.175	CH.14	B District
468.200	CH.15	D District
468.225	CH.16	L District
468.250	CH.17	K District, Batemans Bay, Narooma, Moruya
468.275	CH.18	
468.300	CH.19	Wollongong Special Operations
468.325	CH.20	Wollongong
468.350	CH.21	J District
468.375	CH.22	I District
468.400	CH.23	A District
468.425	CH.24	H District
468.450	CH.25	D District
468.475	CH.26	Metro Special Operations, Bathurst X band
468.500	CH.27	L District, Nowra
468.525	CH.28	C District, Lithgow X band
468.550	CH.29	I District
468.575	CH.30	Tamworth X band
468.600	CH.31	SES CH.1
468.625	CH.32	SES CH.2
468.650	CH.33	SES CH.3
468.675	CH.34	H District
468.700	CH.35	G District
468.725	CH.36	E District
468.750	CH.37	F District & M District, Bega
468.775	CH.38	Special Operations
468.800	CH.39	Wollongong
468.825	CH.40	L District, Northern Rivers X band
468.850	CH.41	J District Special Operations
468.875	CH.42	B District
468.900	CH.43	J District
468.925	CH.44	D District
468.950	CH.45	C District
468.975	CH.46	Milton, Ulladulla
469.000	CH.47	
469.025	CH.48	Newcastle
469.050	CH.49	Water Police, Radio Techs
469.075	CH.50	I District
469.100	CH.51	Tamworth North X band, Cooma X band Security SPC and HQ
469.125	CH.52	Special Operations
469.150	CH.53	Queanbeyan
469.175	CH.54	
469.200	CH.55	B District
469.225	CH.56	J District
469.250	CH.57	
469.275	CH.58	H District
469.300	CH.59	E District, Mt.Selwyn
469.325	CH.60	D District
469.350	CH.61	B District
469.375	CH.62	K District,
469.400	CH.63	Wollongong, Queanbeyan
469.425	CH.64	
469.825	CH.65	Metro simplex
468.400	CH.66	A simplex
469.400	CH.67	Wollongong simplex
468.525	CH.68	C simplex
468.450	CH.69	D simplex
468.725	CH.70	E simplex
468.700	CH.71	G simplex
468.500	CH.72	L simplex
468.425	CH.73	H simplex
468.550	CH.74	I simplex
468.350	CH.75	J simplex
468.575	CH.76	
63-13-20-39		CH.77 Wollongong vote group
28-45		CH.78 C vote group
25-44-15-60		CH.79 D vote group
36-5-10-3-59		CH.80 E vote group
35-7		CH.81 G vote group
27-16-40		CH.82 L vote group
24-46-34-58		CH.83 H vote group
29-22-50		CH.84 I vote group
21-43-8-56		CH.85 J vote group
17-62		CH.86 K vote group
61-42-55-14		CH.87 B vote group
	CH.88	
468.250	CH.89	K
469.350	CH.90	B & Wollongong simplex
469.050	CH.91	
469.150	CH.92	C simplex
468.750	CH.93	F & M simplex
469.425	CH.94	

Channels designated 'X BAND' are available for cross banding. Cross band permits UHF-only cars to communicate with VHF country centres, thereby eliminating the need to have two radios (one VHF and one UHF) fitted to the vehicle.

By far the biggest change introduced by VKG was about three years ago when a complete overhaul of callsigns was undertaken.

Previously a car working within the metropolitan area was called by the division number followed by another number depending on the branch to which it was attached.

Country cars had an entirely different numbering system. Callsigns are now the same across the state, irrespective of location.

They are now made up as follows - the administrative status of the vehicle (ie. Regional, District or Patrol), followed by the branch to which the car is attached.

Sydney police have changed channels and callsigns - Robert Peel brings you up to date

The callsign groups are:

REGIONAL -

Commander Administrative 1,
Staff Officer Operations 2,
Staff Officer Intelligence 3,
Staff Officer Personnel 4,
Staff Officer Community Policing 5,
Staff Officer Operations Support 6-9,
Spare 10-19,
Internal Affairs 20-39,
Legal Services 40-49,
Communications 50-69,
Rescue Squad 70-79,
Aboriginal Liaison 90-99,
Regional Investigative Group 100-179,
Crime Scene 180-199,
Highway Patrol 200-249 (cars), 250-289 (cycles),
Bicycle Liaison 290-299,
Random Breath Testing 300-329,
Breath Analysis Squad 330-359,
Accident Investigation Squad 360-399,
Licensing 400-449,
Warrants & Summonses 450-499,
Dog Squad 500-549,
Spare 550-599,
Transit Police 600-649,
Scientific 600-649,
Fingerprints 650-699,
Others as nominated 700-799.

DISTRICT -

Commander 1,
Commander Operations Support 2,
Intelligence 3,
Personal 4,
Vacant 5-9, District General Staff 10-19,
Special Operations Group 20-29,
Training Co-ordinator 30-39,
Legal Service 40-49,
Communications 50-69,
Rescue Squad 70-79,
Community Relations 90-99,
District Detectives 100-159,
Anti Theft Squad 160-179,
Crime Scene 180-199,
Highway Patrol 200-249 (cars), 250-289 (cycles),
Bicycle Liaison 290-299,
Random Breath Testing 300-329,
Breath Analysis Squad 330-359,
Accident Investigation Squad 360-399,
Licencing 400-449,
Warrants and Summonses 450-499,
Dog Squad 500-549,
Spare 550-599,
Scientific 600-649,
Fingerprints 650-699,
Others as nominated 700-799.

PATROL -

General Duties trucks and panel vans 1-9,
GD sedans 10-119,
Patrol Commander 20,
Shift Commander 25,
Patrol Tactician 30,
Patrol Beats 40-69,
Rescue Squad 70-79,
Community Relations 90-99,
Patrol Detectives 100-159,
Anti Theft 160-179,
Crime Scene 180-199,
Highway Patrol 200-249 (cars), 250-289 (cycles),
Bicycle Liaison 290-299,
Random Breath Testing 300-329,
Breath Analysis Squad 330-359,
Accident Investigation 360-399,
Licencing 400-449,
Warrants and Summonses 450-499,
Dog Squad 500-549, Spare 550-549,
Scientific 600-649,
Fingerprints 650-699,
Others as nominated 700-799.

Regionalisation of the NSW Police Force divided the state into four administrative areas - South, South West, North and North West Regions. Each area has its commander and support staff who are responsible to the State Commander for funding and logistics.

Each region is further divided into a number of districts, which in turn are broken up into patrols. In recent times several new districts have been created, together with a number of 'shop front' police stations.

The abolition of the Criminal Investigation Branch saw detectives from the various squads that made up the CIB, reassigned to Regional Investigation Groups.

The administrative areas are:

REGION	DISTRICT	CALLSIGN STATION PREFIX
SOUTH	SYDNEY	A
EASTERN SUBS		C
NORTHWEST	PARRAMATTA	H
	BLACKTOWN	K
	PENRITH	J
SOUTHWEST	ASHFIELD	F
	BALMAIN	M
	BANKSTOWN	G
	LIVERPOOL	I
NORTH	CHATSWOOD	E
	DEE WHY	D
	GOSFORD	B

Unlike the police in the rest of the country the NSW Police don't as a general rule use radio codes, with all calls being in plain speech.

A number of abbreviations are used, however there is no set standard.

As I mentioned in my outline of VKG, the police do not want idiots following them to incidents and jobs, keep out of their way, stay at home and enjoy the listening.

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Setting Up A UHF CB Repeater.

by Peter Kohlmeyer

I'm sure that many UHF CB operators have wanted to at some stage establish a repeater. Many of us know some great sites that we feel would make good potential repeater sites, but before you go running off to get a repeater going at this site there are a few things that have to be considered.

This article spells out the basics of setting up a repeater. If you have any stories to tell about repeaters you have been involved with or repeaters you want to set up, drop me a line (address at end of article) and let me know what you're up to.

QUESTION NUMBER ONE

Is the area already serviced by a repeater? If yes, does it get much use? If the answer to this is no, then ask yourself why? Is it in a bad position? Is it poorly maintained? If the answer to any of these is yes, I suggest that you contact the owner and ask why. In some cases, the owner may not be aware that the repeater is not functioning to its full ability.

IS THERE A BETTER SITE?

If you know a better site in the area, ask if they are prepared to move it. If they are, you're on your way to having a "power-house" repeater that will service you and many others in your area.

If you don't have a repeater servicing your area, you'll need to find a site capable of covering it and possibly beyond, ideally the top of a high building or hill.

Buildings generally don't pose any problems, and it's usually just a matter of approaching the building owner and putting your case to him/her.

In most cases I have found that they will give you access to the site and none so far have charged for power.

Power could be a problem on a hilltop unless there are already communications sites there and to date solar panels are costly and wind generators a pain in the ass!

Once you have established that a location can well service your needs as a repeater site and you have liaised with the site owner, it is an appropriate time to send an application for a UHF CBRS repeater to your local DoTaC office. Make sure that you accompany it with the necessary payment ($34 the last time I checked), as the DoTaC will generally not process an application without payment.

When filling out the application it is necessary to fill out details on the type of antennas, antenna height above the ground and equipment to be used as well as accurate data on the site location (grid coordinates, map references, etc.).

I found it is a good idea to photocopy a portion of the map where you plan to put the repeater and send it in with the details. Another suggestion is to do some tests on different repeater channels (1 through to 8) and nominate a channel that you feel would best serve your needs without interference from another repeater on the same channel some distance away. I have found that DoTaC will more than likely give you the channel that you nominate.

COST CAN BE DISCOURAGING

The cost of setting up a repeater can often discourage users from going ahead with their plans. As the repeater will service not only you, but others in your area, why not ask about, as other operators may join forces with you to establish a service.

If you get enough users together, and you'd be surprised how many there might be in your area, and you all put in a small amount of money, say $10 or $20 each, you will soon have all the funds you require to get a repeater up and running.

RAISING THE CASH

Some other ideas for raising money for a repeater, especially if you are in the bush, is to approach the local radio station, which is always keen to get involved in something of local interest. They might give you some air-time to tell the community what you want to do. The local newspaper is also another area you could explore by writing an article for them on what a repeater can do for the community. Even approach the local council, you never know what they might give you!

HOW MUCH WILL IT COST?

Setting up a repeater can be an expensive exercise if you undertake it by yourself.

I know of one group that is on a government tower paying around $1300 a year just to use the site. On top of that it has to use a diplexer (about $3000 worth!) and the cost of the repeater, heliax and antenna running in at about another $1500.

This was set up by a group of operators with the attitude that no site would do them but the best! And it works well! Good on you the founding members of the Central West UHF Repeater Association Inc. You've the best repeaters I've ever seen!

MAYBE NOT AS EXPENSIVE AS YOU THINK

You can get a repeater going for much less than that though. There are quite a number of radios about that can be used. They can be picked up for a couple of hundred dollars and turned into repeaters, complete with morse ID board for about another $200. Crystals are worth another $70, all up costing around $500. I've even heard of one repeater using a Kenwood commercial set as the receiver and a Pearce Simpson Leopard as the transmitter!

It is worthwhile to note that due to the close spacing of transmit and receive frequencies, it may be necessary to have the transmitter and receiver housed in separate shielded cases and RF chokes fitted to the connecting leads to maximise receiver sensitivity.

ANTENNA SYSTEM

The cheapest antenna system would consist of two 6dB collinear antennas mounted vertically at least four metres apart to achieve enough attenuation so that minimal de-sensitisation occurs. It is usually best to put the receive antenna on the top and have the two antennas in the same vertical plane.

Depending on cable length required to run from the transmitter and receiver to the antennas, 10DFB is probably the minimum requirement with cables such as LDF4-50A being preferable. 10DFB is around the same price as LDF4-50A but connectors are much cheaper, around $12 compared to $45 for the 4-50A.

As many UHF operators find, it only

akes a little bit of movement in your antenna to make the difference between a mud signal and a strong signal. This too is the case with running a two-antenna system. You are going to find some people can access and not hear it while it will work in reverse for others. There is really only one way to overcome this problem, and unfortunately it is not cheap.

It involves the use of a diplexer, a set of cavity resonators that enable reception and transmission to take place simultaneously on a single antenna.

Because a narrow transmit and receive separation is used on UHF CB, only 750KHz compared with commercials on the 470-490MHz commercial bands of 5.2MHz, most diplexers will require six cavities to do the necessary filtering to give you the required attenuation so that the transmitter will not upset the receiver when both are operating at the same time.

A typical diplexer should provide at least 80dB separation between the transmitter and receiver and should have an insertion loss of 3dB or less.

TAILS AND TIME-OUTS

Tails are one thing that fascinates a lot of operators. They seem to enjoy keying up a repeater just to hear the two or three-second tail and then as soon as it drops out keying it up again.

There are two ways of getting around this. The first is to have a sound activated circuit in the repeater controller to only allow the transmitter to key up once voice is detected.

The problem with this is that the first part of the transmission is usually lost. The second is to incorporate a short key up delay.

This would more than likely have to be designed into the controller. There are a few repeaters operating with this and it is interesting to listen on the input to all the people with their short microphone "clicks", yet nothing on the output.

A short tail is often better than a long one! It might be harder to get a signal reading on a short tail, but all you have to do is wait for the repeater to "I-dent" to see signal strength.

Again most repeaters I have come across with little or no tail and no "roger beep" have very few button clickers. A long time out is better than a short one! Lots of people might disagree with me on this matter, but how many people do you know that would be prepared to leave their transmitter keyed on for three or four minutes trying to time out a repeater, thus making them easier to find because of the length of their transmission? I know that there are many areas which I have not covered in this article, and I will endeavor to get through them next issue, but this should be enough to give most of you that are interested in getting a repeater going, a few tips and pointers that you might not have considered.

Many thanks to those that wrote to me following the article in the Nov/Dec '91 issue of CBA. It was interesting to note in a letter from CREST that it has been having discussions with DoTaC because it (DoTaC) issued a licence to a private company and not to CREST for the establishment of the Sydney Ch 5/35 repeater. One would have thought CREST would have got behind a repeater that services nearly all of Sydney and its outlying suburbs, but it would appear not so! I heard that CREST recently spent several meetings arguing over what color band it would put around its hats for field events.I'm not anti-CREST one little bit, I think that it does a great job, but when you hear about things like that you have to wonder! By the way, another user of CH35 in Sydney is the security guards at the North Ryde RSL, mainly on Saturday nights. Listen out for that one. No sub tone!

Let me know what's happening in your part of the country on UHF and I'll try and include it in the next article.

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Units are fitted with plug connections for external speaker, speaker microphone, antenna, and battery charger.

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- Communications Headset
- CTCSS Board
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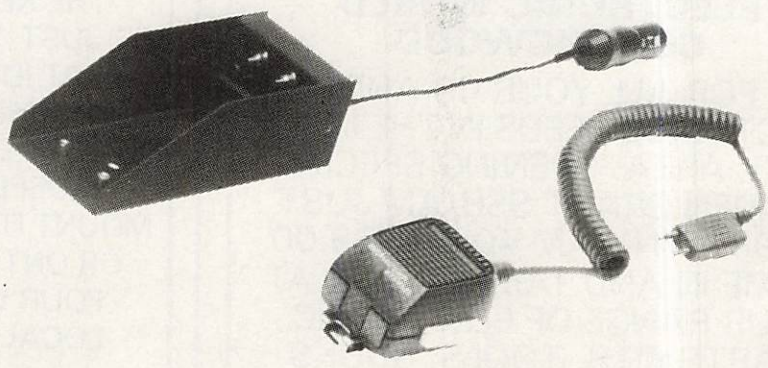
SPECIFICATIONS

TRANSMITTER
Output power: 5 watts
Spurious Emissions:-65db
Current Drain:1.6 amps (high power)
0.45 amps (low power)
Hum and noise: 40db or better
Frequency tolerance:1 KHz or better

RECEIVER
Sensitivity: .25uV for 12dB sinad
Audio output power: 0.5 watts
Hum and Noise: 45dB or better
Current drain: 20mA (power saver mode)

GENERAL
Power source:10.8 V DC 450mAH Nicad battery
Operating temperature:-10 to +60 degrees C
Number of channels: 40
Frequency range:476.425MHz-477.400MHz
Microphone:Electret
Antenna Impedance: 50 OHMS
Size:130(H) 5 63 (W) 5 44(D) mm
Weight: 470 grams (incl battery pack)



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Sangean ATS-818cs

SHORTWAVE, AM/FM and a TAPE DECK!

Richard Jary checks out Sangean's latest shortwave portable.

Sangean, while not around as long as some of the "brand-name" manufacturers, have produced a number of budget-priced shortwave receivers in the last few years.

Their latest offering is the ATS 818cs, a portable receiver comprising coverage from longwave to shortwave plus FM, with a built-in tape deck to boot.

The main feature of the set is the large three-color LCD display on the top right. This display conveys all the necessary information, such as band, frequency, time, signal strength and current memory channel, if applicable.

A quick check of the manual is all you need to learn what buttons to push, what the display will show and how to get started.

The manual starts in perhaps the obvious place - how to get the set going.

This radio takes two sets of batteries: four D cells to run the radio and tape mechanism, and three AA cells to maintain the clock and memories.

The set can also be powered by the supplied six-volt DC adaptor, with or without the batteries in place. Even if the radio is to remain stationary, the AA cells are probably a good idea to maintain memories in the case of long blackouts.

There is also an optional adaptor to run the unit from a car cigarette lighter.

The manual is easy to follow and well laid out, a nice change from the days when many companies produced handbooks in a tortured mix of English, Japanese, Chinese, Taiwanese, Korean or any other language that resulted in instructions like "when up the on button the light is powering"!

The review model appeared reluctant to start some times and it took several attempts to persuade it to fire up.

Even using brand new batteries I had no success until after about 10 tries.

After one last desperate attempt and various cursing it finally started up and all was well.

Unluckily this problem recurred when I replaced the AA cells after having the radio "dead" for about three weeks.

This second time I was unable to persuade the unit to restart, and the only thing operational was the tape unit, powered from the D cells. This may be a fault simply with this particular unit, or it may indicate a more general problem.

The unit has an inbuilt digital clock which can display one of two time zones. This could be used to keep track of your local time plus UTC or any other zone which you find useful.

The clock also runs the alarms and sleep functions, similar to those found on most electronic alarm clock radios nowadays.

You can drift to sleep listening to Radio Tashkent, secure in the knowledge that the set will turn itself off later.

Total coverage of this set is continuous from 150 kHz to 29.999 MHz across the long, medium, and shortwave bands, with AM as the mode of choice.

FM covers 87.5 to 108 MHz. HF SSB is utilised by users such as ham radio operators and many utility stations, including aircraft and marine channels.

Three-way Tuning

Methods of tuning are one of the main features of this set. There are three methods - direct keypad entry, rotary tuning, and scanning.

Each has advantages and disadvantages. Direct keypad entry is the easiest, with one simply pressing the FREQ button, keying in the frequency, and pressing ENTER.

The set will automatically change to the correct band.

There is also a METER button for going straight to a desired shortwave band, if you know its wavelength in metres (for instance, the popular medium-distance band of 9500 kHz is also known as 31 metres).

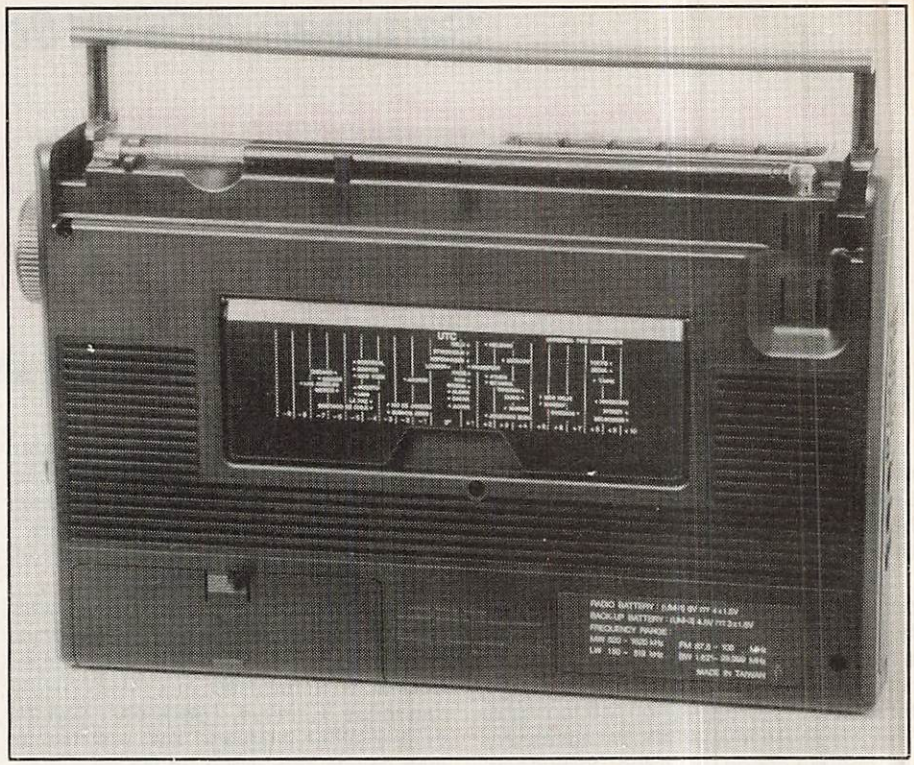
This is a quick way of getting to the desired area of the radio spectrum.

Rotary tuning to your chosen frequency is a two-stage operation.

First you use the "fast" tuning mode to move in 5kHz steps on shortwave and 9 kHz/10kHz on long and mediumwave.

(continued over page...)

The radio is quite large measuring 296 (L) x 192 (H) and 68 (D) and weighs 2 kg without batteries.



Then, fine-tune at 1kHz increments in "fine" mode. The main difficulty with this is that after each turn of the tuning knob the radio takes a moment to bring back the sound, so fast skimming through the band is out. This affects all operating bands, and personally I found it to be a bit of a nuisance.

So why not use the scan mode? This works quite well, tuning through about 50 kHz per second in 5 kHz steps. Unfortunately it suffers the same weakness as most other HF "scanning" receivers, and that's more to do with the broadcast bands and mode than the radios themselves. Whereas on VHF/UHF using FM everything is quiet until you hear a transmission, most of which appear at roughly the same strength, on AM and SSB there is a never-ending jumble of background noise and signals of widely varying strength. So to avoid constant and annoying start-stop scanning the radio will only pause at the very strong signals.

This is fine for tuning through the bands in search of shortwave's "big guns", or finding the next local mediumwave or FM station, but it's useless if you are into hunting DX stations. Still, the DX market is a very different one to the one at which Sangean is aiming with their all-in-one portable for the take-it-easy listener.

The main question - how does the set perform? The manual doesn't mention the three "Ss" (sensitivity, selectivity and stability) so it was a case of try it and see.

Selective And Stable

On longwave the set is reasonable at picking up the aviation non-directional beacons (NDBs). A few were audible during the evening, but the Sydney ATIS frequency of 317 kHz, about 90km south of my QTH on the NSW Central Coast, was fairly weak and hissy. On mediumwave, the Sangean does appear to lack in sensitivity compared to most other radios.

The presence of the mediumwave band is obviously just part of the "must have" standard package for everyday use, and it's certainly not what is required for those chasing US or Asian stations. The selectivity is quite good though, with the local 2GO not breaking through to the adjacent channels.

But the main reason you'd purchase the set would be for shortwave.

I was quite impressed with the stability shown while monitoring Sydney Aeradio on 8867 kHz talking to Air Force 1 during US President George Bush's recent visit. Very little BFO adjustment was needed to keep the sideband signal sounding good.

The set was reasonably sensitive, although not outstanding. Weaker stations did suffer some distortion in audio quality, more than might have been expected.

Many shortwave sets have FM tacked on only as an afterthought, and are only capable of picking up the stronger signals. The Sangean does quite well here, with some of the weaker Sydney community FM stations audible.

Driving the set is quite easy, apart from the tuning discussed earlier.

Also on the front panel are FM mono/stereo and AM wide/narrow (bandwidth) controls, BFO pitch for receiving sideband signals, as well as a light switch. In common with many scanners the light stays on for 15 seconds to avoid flattening the batteries too far. There are also gain and tone controls for the AM bands. Hiding around on the set's right side near the rotary tuning and volume knobs is the switch for fast/fine scan that includes a lock function to disable any key input while moving the set around. I found this switch to be a bit out of the way and think it would have been better on the front panel where it could be better seen and operated. On the left are sockets for DC input, external mediumwave aerial and a 3.5mm stereo phone jack. This allows listening to FM signals in stereo on a pair of Walkman-style headphones.

And the tape deck? Apart from allowing you to listen to cassettes of such cultural gems as Kylie Minogue, you can tape "live" using the inbuilt microphone or record a station off-air.

In conjunction with the clock timer you can set the ATS818cs to record a station at a pre-determined time. This is probably the most important feature, especially useful for taping regular favorite programs that arrive Down Under at the strangest times. The set also has 18 memory channels for shortwave, and nine each for the other bands.

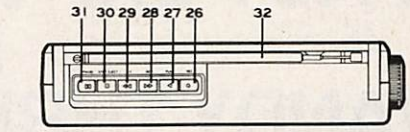
Summary

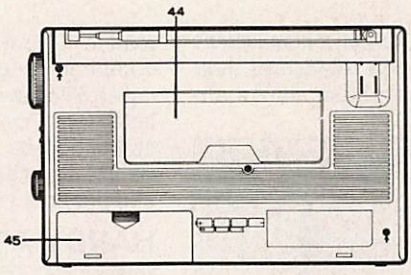
The ATS-818cs handy portable size of 296 x 192 x 68 mm and 2kg weight makes it easy to carry around, so it's good if you're on the go. The main limitations are on the tuning side, with the short silent period that occurs when rotary tuning making searching for weak stations a somewhat slower process than it could otherwise be.

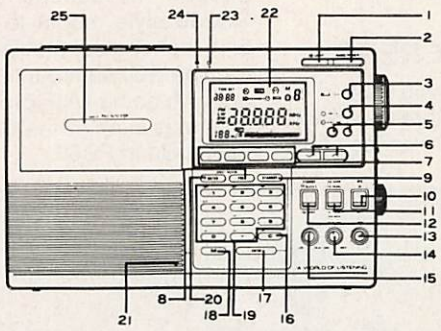
On a positive note, the set's sensitivity on the shortwave side would make it a reasonable option for someone who wants to keep in touch with home through one of the major broadcasters around the world. It would also be ideal for the beginner DXer who wants a taste of the world of shortwave, but seeks a reasonable compromise between price and performance.

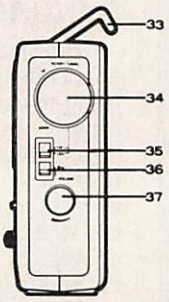
CONTROL LOCATIONS

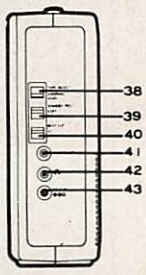
1. Display Light Button
2. Radio Power on/off Button
3. Sleep Timer
4. Time Set
5. Dual Time Set
6. Manual Tuning/Auto Scan Button
7. Band Selector
8. Frequency Select Button
9. Standby Button
10. BFO on/off Selector
11. FM Stereo/Mono Mode Selector
    AM Wide/Narrow Mode Selector
12. Alarm By Radio/Buzzer Selector
13. BFO Pitch
14. RF Gain Control
15. Tone Control
16. Cancel Button
17. Enter Command Button
18. Memory Entry Button
19. Numeric & Bandwidth Button
20. Meter Select Button
21. Built-in Microphone
22. LCD Display
23. Tape Recording LED Indicator
24. Tape Playing LED Indicator
25. Cassette Tape Compartment
26. Tape Recording Button
27. Tape Playing Button
28. Tape Rewinding Button
29. Tape Fast Forward Button
30. Stop/Eject Button
31. Pause Button
32. Telescopic Antenna
33. Carrying Handle
34. Rotary Tuning Knob
35. Tuning Speed Control
36. Lock Switch
37. Volume Control
38. CrO_2/Normal/Tape Select Switch
39. Timer Recording on/off Switch
40. Beat Cut Switch
41. AM External Antenna Jack
42. Stereo Headphone Jack
43. DC Input Jack/6 volts
44. Folding Stand
45. Battery Compartment











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GME/Electrophone Specials

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TX 840 AM/SSB 27 MHz CB Deluxe with Antenna Kit (AE214)	$349
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Z69	Heavy Duty 27 MHz 1.9 mtr, parallel	$75.00	T14	Slim 27 MHz 380mm, parallel	$25.00
HD69	Heavy Duty 4WD 1.9 mtr, spring & mount	$235.00	Z24	Slim 477 MHz 4.5dB Gain	$29.00
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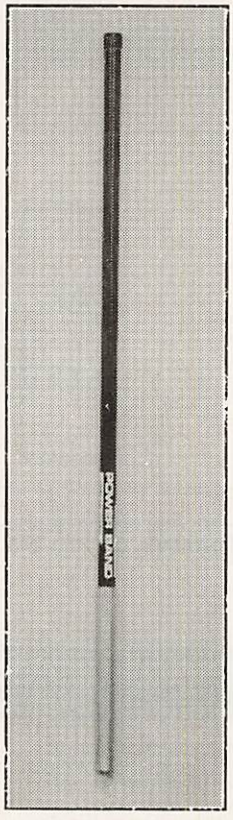
CBA/3-4

NEW PRODUCTS

COMPACT UHF 6dB BASE ANTENNA and HANDY THREAD ADAPTORS

POWER BAND COMMUNICATIONS has just announced the release of their new compact 6dB gain base station antenna. The new antenna uses the same heavy duty fibreglass radome as the popular PB900 base antenna but the overall length is only 1.2 metres with a mounting sleeve diameter of 32 millimetres. The mounting sleeve length has been reduced to 200 millimetres from 300mm to help produce the compact appearance.



The 'MINI 6' is polyurathane foam filled (as are all Power Band UHF base station antennas) so the assembly can be considered virtually weatherproof. Cable connection is via a weatherproof 'N' type receptacle with the feed impedance a nominal 50 ohms.

The 'MINI 6' is ideal for use in limited space situations like 'high density living' or for the thousands of operators who want base station antenna performance without the 'antenna-farm' appearance.

With the usual high quality materials, solid construction and excellent performance typical of this manufacturer, the company should find the 'MINI 6' a big seller. The new unit is presently only available from Power Band Communications in Melbourne and Hobart. See Power Band advertisement for address details and phone numbers.

HANDY ADAPTORS FOR WRONG THREAD SYNDROME SUFFERERS

How many times have you wanted to adapt one type of antenna thread or base fitting to use with a different series...and how many times have you finally given away to frustration and chucked the lot into the rubbish bin?

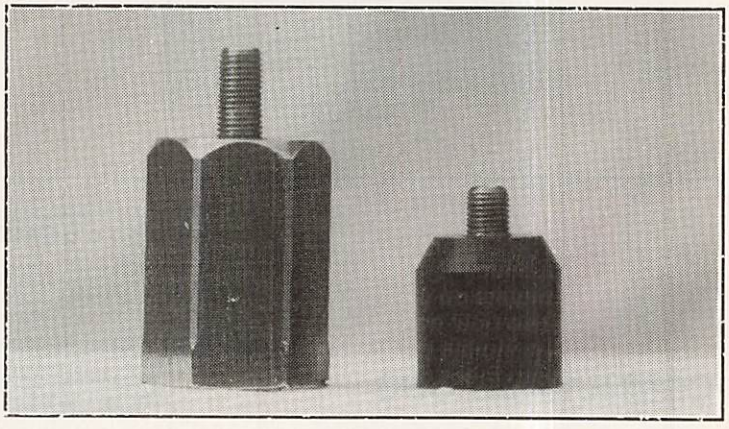
If you qualify for the above, there's good news for sufferers of the 'wrong thread' syndrome.

POWER BAND COMMUNICATIONS is releasing two new series adaptors to solve most of the problems.

The Multi-Thread-Adaptor (MTA) is a pretty hefty piece of chrome plated brass designed to convert your heavy duty half inch Whitworth base to the smaller 5/16 inch brass thread, or to the 3/8 inch UNF thread used on some American and Japanese antennas (male or female threads) or to the less common 1/4 inch standard. This adaptor is ideal for those operators who use the 'Big Gun' antennas for long-haul work out of town but would rather use a smaller more practical one back in the city.

The adaptor also offers easy conversion from your heavy loaded antenna mount to a stainless steel full length whip which usually employs the 3/8 inch UNF thread. The second unit adapts your SO239 style mount to take a standard 5/16 inch (brass) mobile whip.

The SO239 mount is supplied standard with some UHF ground independent antennas such as the GME AE409 or the Power Band PB60.



The thread adaptor screws on to the SO239 mobile mount converting it to take a standard UHF or 27MHz whip.

Both adaptors are available from POWER BAND COMMUNICATIONS in Melbourne and Hobart.
Melbourne 'phone (03) 584 7631 or fax (03) 583 0846.
Hobart 'phone (002) 73 2511 or fax (002) 73 2505.

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Ken Reynolds of Powerband Communications gets...

Back to the basics

CHOOSING A POWER SUPPLY and MOUNTING/SWRing A MOBILE ANTENNA

Operating a base station at home can be an expensive business and most operators opt to use a mobile transceiver and separate 13.8 Vdc power supply due to a noticeable lack of dedicated home base units with built-in power supply. Even though CB has been around for 15 years (legally that is) you can still buy into an on-air argument about power supplies without looking very far.

As a general rule, a heavy duty power supply offering good regulation of the output voltage and plenty of current is the safest choice - it is also the most expensive.

If you are tied into the devaluation spiral like most of us, a good bench supply is simply out of the question.

So, how can we find out exactly the right size power supply to properly do the job?

The radio manufacturer usually comes to our aid on this one. Virtually all CB radios come with an operating manual (although some are hardly worth supplying in the first place) which also contains a list of the rig's specifications.

While many operators don't bother to read the manual until there's smoke coming out of the back of the unit at which time it's a tad too late, the specifications page will generally hold the precise answer to the power supply dilemma.

Find the section that refers to operating voltage - which in all but the most unusual case will be 13.8Vdc (13.8 volts direct current).

Next to this information is usually printed a short table of the maximum current the transceiver requires when receiving only and when transmitting at maximum power output.

The measurement is in amps (amperes) and this will tell you the minimum power supply requirement for the rig to operate efficiently.

"AM ONLY" RIG USES LESS, UHF SOMETIMES MORE

Remember, "AM only" CBs require considerably less current than sideband rigs - for transmit at least. Some UHF rigs require larger supplies than others - look at the manual first and you'll probably save time/money in the long run!

While determining the rig's needs is straight forward, it is not always so easy to decide on the correct power supply. Most power supply manufacturers also include a specification sheet with their products.

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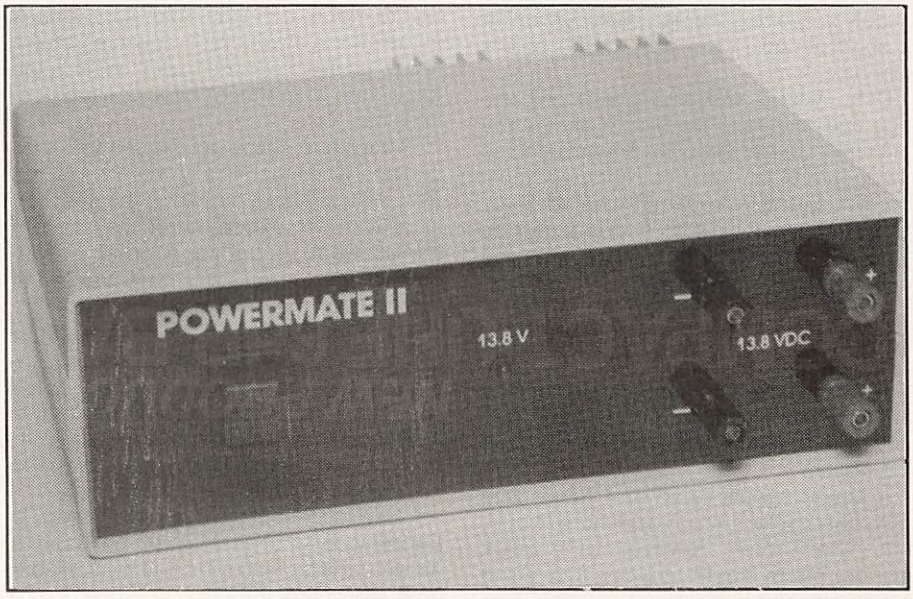

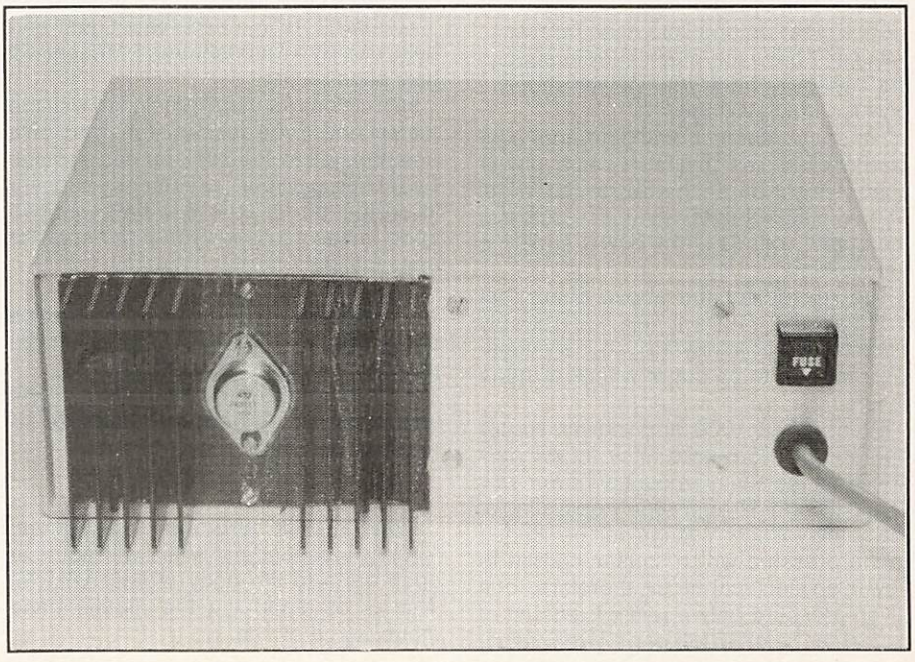

This Dick Smith Electronics' power supply is simple to build and will power two rigs, using two 13.8 volt outlets on the front panel.

BACK TO BASICS

(continued...)

Unfortunately, whether by accident or intent, there sometimes seems to be a short-fall in the information included.

What you need to know is the continuous output current, the peak output current and the duty cycle of continuous and peak output current.

If for example the power supply is rated at 2 amps and no further information is offered, reserve judgement and hold onto your money until you have investigated further.

While your rig may only require 2 amps for proper operation, it is possible that the supply only offers 2 amps peak current for a short period (a low duty cycle) before straining itself.

Duty cycle is expressed as a percentage and relates to the length of time the maximum current may be drawn safely to the length of time that current drain must be reduced to a lower nominated level. Sometimes duty cycle is expressed as time on against time off periods, e.g. one minute on, one minute off.

TWO AMPS, CONTINUOUS or PEAK?

For example, a power supply offering 2 amps continuous and 4 amps peak with a 50% duty cycle is adequate to run most CB radios.

A power supply rated at 4 amps with 50% duty cycle may have no more to offer than the former, however, at a quick glance, many would assume that the 4 amps supply was the best.

Let's clear up one little myth forever ... You can't have too much current supplying capability from your power supply - only too much voltage.

For some reason many operators concern themselves that a 40 amp power supply might be dangerous to their rigs. The only time that this danger exists is if the output voltage of the power supply is set too high.

The reason for the above being that Voltage and Current are inextricably linked together in physics, so it is impossible for one to be out of whack with the other.

Even with a 1000 amp power supply operating at 13.8 volts, your rig will only consume the same amount of power as it would using a 10 amp supply operating at the same voltage. Voltage can be likened to the pressure which causes current to flow in an electrical circuit, therefore, for a given pressure only a related amount of current can be forced to flow in a given circuit.

Finally, never use a power supply which is not designed to operate a CB radio or similar type equipment. Battery chargers and model electric train transformers are definitely out.

MOUNTING AND SWRing MOBILE WHIPS

This is a subject we have not looked at for some time. If you have "been there, done that" there is plenty more to read in this issue, however, those who are new to CB (and judging from the response to the recent readers' survey there are plenty) always find that mounting and tuning a mobile whip is a difficult business to say the least.

CENTRE OF ROOF IS BEST - BUT!

Most people know that the best position to mount a mobile antenna is smack in the centre of your roof, however, only a few of us are prepared to drill holes in the top of one of our most highly prized possessions.

The truth is, there are horses for courses and while technically we may get the best results from butchering the car roof, in real terms excellent results are obtained from mounting a good quality mobile whip in any one of a variety of positions on the vehicle.

As a general rule, longer antennas offer greater efficiency than short aerials. Antennas less than 30cm long (for 27MHz use) are often questionable in performance and they are frequently very difficult, or even impossible, to tune properly regardless of where they are mounted.

A SWR (Standing Wave Ratio) meter is the most common test instrument used to aid antenna tuning and is readily available from most CB shops.

You don't really need the biggest and best, usually a rudimentary instrument will give good results.

Instructions for use are included with the meters and, if you decide to tune your own antenna, follow the book for best results. Better still, get your own antenna supplier to do the job for you. You have got two good things going for you if the supplier does the job:

1. **He has probably tuned hundreds of aerials and knows what potential problems may be encountered.**

2. **If he destroys the antenna, he wears it - providing the antenna is installed correctly.**

MOUNTING SPOTS

Unless your antenna is a special "ground independent" type it will require a good earth to the body of your vehicle. This is obtained via the mobile base mounting hardware.

The importance of this earth connection cannot be stressed too much - without it, the antenna will not work properly and an adequate SWR will not be obtained. Your CB antenna is only one part of the system - a bit like only half the aerial system. The body of the vehicle supplies the other half - one is dependent on the other.

USUALLY TOO LONG RATHER THAN TOO SHORT

The antenna is designed to be slightly too long for the job when purchased and after installation it will be necessary to "trim" the length to obtain the desired results. Another way would be to start ripping bits off your car - start with the bumpers if they are not plastic, otherwise remove one front mudguard and check the SWR before removing the other! Some antennas do have adjustable tips, however, even then it is sometimes necessary to cut off a portion of the tip to tune the antenna properly.

There are various types of hardware designed to help you mount an antenna without the need for drilling holes in your vehicle. These include gutter grips, boot-lip mounts, magnetic bases, and mirror mounts which double as ski-bar mounts. These accessories offer a fair amount of latitude in where you might successfully mount your antenna. However, the first rule of thumb still applies - each type of mounting arrangement MUST connect well with the body of the vehicle.

GOOD EARTH IS ESSENTIAL

To do this properly, the mounting screws must penetrate the paint work and produce a secure electrical contact with the metal beneath. Magnetic bases rely on a different type of earth coupling. If you use a ski-bar or roof rack bar of some description, be sure that they are suitably earthed. Many roof carrying bars employ plastic "feet" to avoid scratching the roof or guttering channels. These points must be earthed to the body of the vehicle. It is often not enough to earth only one end of a ski-bar - both ends should be attended to.

If one end of such a bar is left unearthed it can produce a type of tuned circuit which will defeat all attempts to tune the antenna.

Brackets mounted on "bull-bars" are also common mounting spots for CB antennas. Again, a good electrical contact to the vehicle is absolutely essential for proper operation.

Sometimes a poor connection to earth in any of the popular mounting position will allow an antenna to tune adequately, however, high resistance connections are frequently the cause of electrical noise problems in CB receivers. If you experience this problem, try moving the antenna mount to a different location and check the results before spending bulk money on other curative measures.

USE THE BEST CABLE AVAILABLE

If the co-axial cable connecting the adio to the antenna must run through the ngine compartment of your vehicle - use ommon sense and keep it as far as pos- ible from the engine electrical system. lso, use the best cable you can buy. Top rade cables always have very tightly oven earth shields which help prevent he entry of electrical noise.

CAUTION

Having mounted your antenna and adio, proceed with caution before testing he transmitter. DO NOT just plug in the ntenna cable and try to talk to the world it could be an inconvenient, expensive nistake.

Double check the antenna installation or short circuits and loose or "off" wires. f you have access to a multi-test meter hat allows you to check resistance or a ontinuity meter of some type, take the ime to perform a few basic safety checks. Connect the meter probes across the nner and outer terminals of the able/coaxial plug - you should read an pen circuit (no connection).

If not, find the problem before continu- ng. The most common source of short ircuits is frayed braid in the connector ridging across to the centre terminal - ou may need to reterminate the plug.

Another common problem is the incor- ect mounting of the base mount - the entre bolt must be electrically isolated rom any earth connection.

Sometimes the connections at the mounting base have been reversed - heck that you have connected the outer able screen to the earthed part of the ase - the inner cable conductor always onnects directly to the antenna bolt in the mobile base.

Next check with the multi-meter that the centre pin of the connector actually con- nects directly to the antenna bolt on the mounting base.

Occasionally and for no apparent reason, there is a break within the cable and the connection is lost. There may be no visible signs that something is wrong.

This might appear to be an alarmist attitude and, most likely, you will find that all is well.

However, the reason behind the basic test is well founded and it is better to be safe than sorry.

Unfortunately, some CB radios are par- ticularly sensitive to incorrect antenna loading and should you transmit into an improper antenna system the radio's out- put transistor can be destroyed in an in- stant - often faster than it takes for the transmit indicator to even begin to move. This type of damage to the radio is not usually covered by the manufacturer's warranty - so, if you blow it you wear it!

The kit for the D.S.E power supply comes with everything including a substantial transformer, solid plastic case - and comprehensive instructions. Assembly time is around two hours or so.

When you are sure that all is well, con- nect the antenna to the radio and adjust the controls for reception only - if you are not familiar with the operating require- ments of your radio, read the instruction manual. If the antenna is "in the ball park" you should hear plenty of activity and the radio should sound "lively".

If you can't hear anything much and there appears to be very little background noise chances are that you have a prob- lem. Go back to step one and start again.

Still no luck? Better get a more ex- perienced opinion but **DON'T TRANSMIT** just to find out if something is wrong.

TUNING THE ANTENNA

Everything seems OK? Time to set about tuning the antenna.

If this is your first attempt at tuning, it is suggested that you get some help - it really is so easy to cut an antenna too short on your first try.

This of course gets you into a whole new set of problems.

SWR AND TUNING

Tuning an antenna is much akin to tuning any other type of circuit - your ordinary car radio is a good example. When you move the tuning control, you do it carefully so that you can clearly hear the station - a tiny bit one way or the other and you don't get the right results.

A CB aerial is a similar type of tuned circuit and requires an even more careful approach - usually, if you tune too far it's not so easy to go back again.

Set up your SWR meter according to the instructions supplied. It is a good idea to practice calibrating the meter a few times before you attack the antenna, and per- form the operation quickly so that you only transmit for a few seconds at a time. If the SWR is bad initially, short transmission are least likely to damage your radio.

Always conduct the SWR checks by alternating between the highest and lowest channel numbers. Use ch1 and ch40 (unless of course you're using a TS440S in which case you can suit your- self) - the channels in between will pretty well look after themselves.

If the antenna is too long (which it usual- ly should be) you should read the lowest SWR on channel 1. Make the adjustment a little at a time and check the result on both high and low channels. If you have a fibreglass style whip, use a small saw to make the cuts - never use pliers as they tend to crush the fibreglass and per- manently damage the antenna.

If the SWR has improved, repeat the process until the SWR is quite low on the lowest channel. Final trimming should be done carefully so as to balance out the SWR at both ends of the band. If you have gone too far, the SWR on channel 1 will begin to increase and it may be now lower on the highest channel number. If both readings are below 1.5 to 1 you have done well. Many antennas may produce results where the needle will barely move at either end of the band. Stop at this point and pat yourself on the back...don't keep trying to obtain the "magic 1:1" it's hardly worth the trouble.

(Continued over page...)

BACK TO BASICS *(continued . . .)*

Short antennas may be quite high at each end of the band with a dip occurring towards the middle of the channel range — again, stop tuning, this is about the best you can hope for. Some antennas (especially the short ones) may be incapable of producing a low SWR across all the channels.

If you think you have cut the antenna too short, press the PTT button and observe the meter, while moving your hand close to the antenna. If you observe a "dip" in the reading during this process, chances are that you have "over pruned".

You might need to buy another antenna, or, try extending the old one — it's a good idea to experiment this way before you destroy number two.

If the effect of your hand near the antenna only increases the SWR reading it is most likely that you still have some "pruning" yet to do.

WHAT THE SWR METER READS

When you press the PTT button radio frequency energy (RF power) is directed into the coaxial cable.

Pressing the transmit button of your radio is a bit like turning on a tap — the transmit energy is released and has left the source.

Since energy cannot be destroyed, it has to go somewhere — in this case it will travel along your coaxial cable until it reaches the antenna.

If the antenna provides the right set of conditions the energy will be released into the world in the form of radio waves. Under optimum conditions virtually all the energy is radiated from the antenna.

Under less than adequate conditions (poorly tuned antenna — poor SWR) the energy meets a blockage at the antenna and only part of the energy is radiated. The remainder of the energy, since it is indestructible, must go somewhere — and it does. It travels back down the transmission cable toward the transmitter, or back where it came from in the first instance.

YOU GUESSED IT!

On the return journey it meets a fresh burst of energy coming the other way.

A state of equilibrium is quickly reached where at certain points along the coaxial cable the values of energy add together and become our old enemy — Standing Waves.

At other points along the coax there will be a subtraction of the energy levels and a trouch will result which is equivalent to the different in the amounts of energy at that point.

YOU'LL NOTICE THE PUFF OF SMOKE

If one of these energy lumps happens to peak right at the output stage of the transmitter, the power produced at that point can be sufficient to overload the output transistor and destroy it.

An SWR meter is designed to read the effective power travelling along your coaxial cable in either direction, thus we have the two scales on the meter, forward (FWD) and reverse (REV or REF). Sometimes the reverse direction is just labelled SWR.

Since we can read either value at the flick of a switch we can calibrate the forward direction for maximum and then observe the left-over level — the power which has been returned unused from the antenna.

Obviously our intent is to send all the power to the antenna and have as little as possible returned down the line to the transmitter.

When the antenna is tuned properly we approach the desired conditions and therefore read a low SWR.

So, there you have it . . . simple isn't it . . . when you know how.

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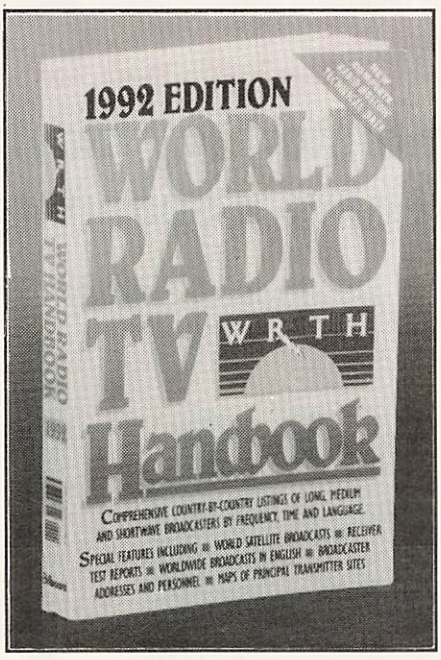
BOOKS

by David Flynn

COMMUNICATIONS PUBLICATIONS WORTH READING

Recession notwithstanding, books represent extraordinary value for money - none more so than these latest offerings from Dick Smith Electronics.

World Radio And TV Handbook


1992 EDITION
WORLD RADIO TV
W R T H
Handbook
COMPREHENSIVE COUNTRY-BY-COUNTRY LISTINGS OF LONG, MEDIUM AND SHORTWAVE BROADCASTERS BY FREQUENCY, TIME AND LANGUAGE.
SPECIAL FEATURES INCLUDING ■ WORLD SATELLITE BROADCASTS ■ RECEIVER TEST REPORTS ■ WORLDWIDE BROADCASTS IN ENGLISH ■ BROADCASTER ADDRESSES AND PERSONNEL ■ MAPS OF PRINCIPAL TRANSMITTER SITES

The WRTH is back again, and it's still THE bible for mediumwave and shortwave DXperts and anyone with a technical interest in the state of the global broadcasting scene.

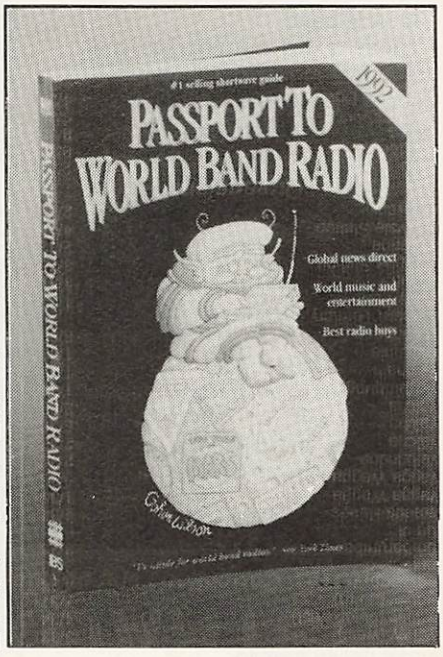
This perennial best-seller is now in its 46th year, under the editorial guidance of Andy Sennit, some dozen specialists and contributing editors plus a worldwide monitoring team briefed to keep an ear on the bands and ensure the WRTH remains up-to-date between editions. What do you get for your money? Nearly 600 pages packed with information in the Handbook's traditional and familiar format. The World Radio section comprises the bulk of this, listing all broadcasters (domestic and international) per country with transmission times, frequencies, languages, transmitter and station data, postal address and QSL details.

This sort of comprehensive detail which the WRTH provides may or may not be your cup of tea, but you can never tell... when reviewing a previous edition of the WRTH some years back I made light of its inclusion of nearly every radio and TV station known to humankind.

To illustrate my point, I said that I doubted I would ever need to know that Singapore's "Perfect 10" FM station broadcast music in English 24 hours daily on 98.7 MHz. Sure enough, within weeks I found myself on a trip to Singapore and quickly had my Sony SW1 programmed with Perfect 10 and a selection of other FM and shortwave frequencies for the region!Also appearing is a similar section on world television (including an ever-growing roll call of satellite broadcasters), longwave and mediumwave stations and pirate "clandestines"; maps of principle transmitter sites around the world and propagation forecasts for 1992.

DSE's price on the WRTH remains a very affordable $35.95.

The Passport To World Band Radio



How to best explain the difference between these two tomes? It goes beyond presentation and editorial content. It's a matter of style, target audience and the very reason why each book is written.

The Passport is relatively new to Down Under DXers, apart from limited exposure through technical bookshops and a very few radio stores. But DSE have put the Passport into all their stores across Australia and it's selling fast, just as it has around the world since in began in 1985 as the Radio Database International.

The Passport retails for $34.95 and by way of comparison reads more like a glossy magazine than the WRTH's technical textbook appeal. There's ample use of color in the 385 pages, an emphasis on English language broadcasts (although not at the expense of other languages) and a "ground up" approach to shortwave radio, or as the Passport prefers to call it "world radio". The Passport contains a thorough introduction to shortwave that you just don't get in the WRTH: how to get started, choosing the right radio, reviews and thumbnail reports on all currently available portable and desktop models, a "top ten" shortwave shows to tune plus 20 entertaining "big guns" which you can hear almost anywhere and on any receiver.The distinctive style of editor Larry Magne is stamped all through the Passport. Magne is one of the shortwave world's most authoritative writers, and apart from Bill Cheek few radio scribes have such a light, friendly and accessible tone. Magne is naturally opinionated (show me a writer without an opinion and I'll show you a boring writer), but he is always well informed.

The "World Scan" section looks at world radio broadcasts in English in an hour-by-hour format, with frequencies current at the time of going to press. There are separate lists of country-by-country broadcasts in English and other tongues, tips on station QSL procedure (including a fascinating list of "collectibles" such as pens, stickers and key-rings and the stations which will send you such on request) and how to get the best results when seeking that verification. Again, it's all very practical "how to do it" advice.

The Passport's "Blue Pages" shortwave broadcast schedule lists programs in a unique barchart format along the page. I last saw this style in the outdated booklet which Sony issue with their more expensive shortwave portables and to my mind it still remains superior and far more readable than the WRTH listings. It's horses for courses, and DSE have neatly covered both ends of the market with the best books in the business. Which one's for you?

The Passport to World Band Radio is clearly for the beginner to this fascinating hobby, and fulfils the promise of its title.

Likewise, the WRTH is a handbook with a complexity that would deter the newcomer but which the seasoned enthusiast will welcome. What they share is that both are unbeatable value for your DX dollar.

REVIEW OF THE AR 900 J HANDHELD SCANNER

Into aircraft monitoring? Maybe satellites? Then do I have a scanner for you!

By Russell Bryant

Fellow CBA contributor Bob Bell, makes no secret of the fact that his first love of monitoring, is the VHF and UHF AM aircraft bands, with military communications following a close second.

Needless to say, that Bob considers monitoring military aircraft and satellites the ultimate pursuit.

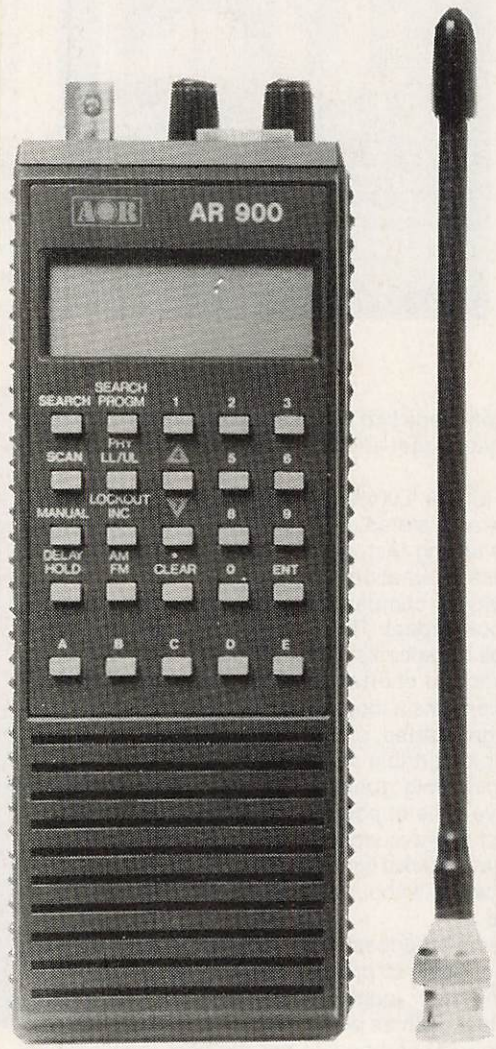
He is however, not so one-eyed as to ignore the other bands.

For example, nearly all civilian carriers, both domestic and overseas, have additional comms channels to those within the 108-136 MHz band.

These extra frequencies are used for a variety of in-house services and purposes, engineering, baggage handling, security and catering to mention but a few.

With those two categories of monitoring in mind, it would be terrific if one scanner, particularly a handheld, could be found that would cover both the AM VHF and UHF aircraft bands, yet have variable receive modes so that UHF satellite traffic could be intercepted plus give access to the highband VHF, UHF land mobile allocations and 800 MHz for listening in on the associated airport services.

Wait no longer, Access Communications, agents for AOR (among other brands) has just the handheld scanning radio for the serious airbander, military aircraft and satellite monitor.



Based on the popular 900 series portable, the AR 900 J covers the following bands, 108-136, 137-174, 220-290, 300-380, 406-470 and 830-950 MHz.

Because the lower VHF bands have been deleted, the receiver is tuned for optimum performance at the higher frequency allocations.

As the 900 J has user switchable AM/NFM modes both aircraft and satellite comms can be intercepted. Match all that with a sensitivity of .4 microV to 1 microV and you have a radio that offers versatility.

100 memory channels, five user programmable search banks and variable search increments (5, 10, 12.5, 25 and 30 kHz), add to the overall appeal of the AR 900 J. To avoid images and improve selectivity, AOR use a 21.4 or 54 MHz first IF (depends on band), with a standard 455 kHz as the second stage.

The AR 900 J comes with its own internal ni-cad battery pack or it can be driven by an external six-volt source.

From a fully charged pack the user can expect a good six hours of operation before recharging is necessary.

When the batteries are all but discharged a visual warning is given via the LCD display. Bat-Low will flash when all is about to go silent.

The AR 900 J covers the VHF and UHF airbands, together with highband VHF and UHF land mobile services, plus 800 MHz. Russell Bryant checks out this fist full of frequencies, then makes you an offer you can't refuse.

AR 900 J scanner is a neat unit and comes complete with ni-cad battery pack, boardband whip, belt-clip and earphone.

The AR 900 series scanners have a non-volatile memory, they do not need an additional battery to support the memory should power be removed.

Once you have entered a frequency into a memory it is there until you change it. Audio from the built-in speaker is quoted at 200mW, which is not much, however the 900 J was able to drive an external speaker thereby improving audio quality.

AOR 1000 owners will immediately identify the supplied whip, the DA 100 is a good all-round aerial suited to the receiver. The BNC facilitates easy connection of other antennae, both on-set and external.

Because the 100 memories are divided into five banks of 20 (labelled A-E inclusive), it is easy to organise what goes where.

The first 20 could contain VHF airband, UHF airband in the second 20 and so on. To lock out any unwanted bank/s simply depress the corresponding letter key.

At the quoted scan rate of 15 channels per second, it takes the 900 J just over a second to scan a single bank or six and a half seconds to cover the entire 100 channels. The AR 900 J suffers, like all other scanners, from birdies, or internally generated RF.

There did not appear to be any more than encountered elsewhere in more expensive equipment. Programming is no more complicated than entering the frequency and mode, manual to the next channel and repeating the steps.

Frequencies detected during search can be 'transfered' to a memory by entering them into the desired channel.

If you wish to manually step through a search bank, then depress the arrow up or down key to initiate the process.

The AR 900 J measures 160Hx50Wx40D (mm), so it is small enough to fit into a shirt pocket, or enclose within a bag.

For the serious airbander or just someone who makes the occasional excursion to the bands, the 900 J would complement the usual binoculars, camera and associated bits and pieces, without weighing you down.

Because the 900 J not only receives the aircraft bands, but also the land mobile VHF and UHF bands it is possible to track an aircraft from when it comes under VHF control right up until the last passenger had de-planed.

Ever wanted to check-out the activity on an airline security channel and not been able to because you airband only receiver stops at 136 MHz? No problem with the AOR. The AR 900 J comes complete with ni-cad battery pack, broadband whip, belt clip and earphone.

Now for the good news. The normal recommended price of the AR 900 J is around $400. As a special offer, however, to CBA readers, Access Communications has set the price at $299 **(while stocks last), on presentation of the attached coupon.**

The offer is available either in person at any of the Access Communications outlets, or by mail order (mail orders please enclose an additional $12 to cover courier delivery).

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dx international

DX - UP, DOWN and AROUND 11 METRES ***...with Jack Haden***

Sporadic longpath Europe and North Africa has been about once again, although the openings tend to be rather irregular, the rewards are there. A good antenna in the right direction and some periods spent listening rather than calling should reap some results. As usual, the hurly-burly of Western Europe is with us most evenings via the shortpath, signals have ranged from very poor to excellent at times, proving that the 11 metre band is far from dead. As I have mentioned in the past, those with a decent beam or quad antenna will no doubt have the edge over those with verticals or dipoles, especially when signals are marginal copy.

A QUESTION OF CREDIBILITY

The credibility of Mr Tom, the 304-ES-1O1 in Estonia has been open to question yet again. On the evening of 29 January at 1O25z a station in Europe was holding court on a frequency that Tom was using to work DX and hurled a verbal volley of insults and accusations at him.

"You lying stinking bastard, you are a con man and a thief Mr Tom, how dare you screw hapless DXers the sum of US$2 for your QSL cards, why don't you tell the truth and tell everyone you are in Finland and not Estonia?

Mr Tom you leech, you robber, why don't you get out and work an honest job instead of conning people on the radio you bastard."

The particular station kept the abuse up for near one solid hour with Tom ignoring him.

I know there are quite a number of DXers around the world, Australia included, who are still waiting for Tom's card after sending all the trimmings months ago.

However, I have personally seen one of Tom's cards, but not the envelope it was mailed in so I cannot say whether in fact it was mailed from Finland or Estonia.

Tom does however use the Viimi Radio Club amateur QSL cards with the callsign UR1RWX on the front, a quick check in the ARRL, Foreign Listing callbook proved the address that Tom gives on air to be that of the Viimsi Radio Club in Viimsi Estonia.

So maybe he is in Estonia after all and some DXers have got their marbles mixed up?

However that doesn't clear up his poor track record in replying to valid cards sent to him. I personally think he could lift his game a little in this area.

AFRICA & INDIAN OCEAN REGION

Conditions to this part of the world continue to be rather poor at times on the eastern coast of Australia and the Pacific within regard to good shortpath openings on the band.

- **Uganda** has been about on brief occasions with a station signing as Radio Uganda 562, name unknown. He was a fair five by two at O91Oz but soon was submerged in the noise from Europe.
- **Liberia** has been about via the longpath openings with Rich, who signs as the 42-AT-1O1, being heard on the band at 2O56z. Although a poor three by one he did manage to work a couple in New Zealand at the time. Rich is located in Monrovia.
- **Morocco** was noted at 2O45z by way of Mek who signs as ACE-RADIO from Rabat, the capital of Morocco. Mek was a fair five by two and was looking for the USA.
- **Malawi** was just audible at O4O5z by way of RON who signs as "RC" and at the time Ron was a very poor three by two signal report here, although a station over in the west gave him a five by six report.
- **West Sahara** has been with us on odd occasions by way of Massimo who signs as the 3OO-AT-1O1. Massimo was a poor three by two on the longpath at 2O2Oz but quickly faded away by 2O35z. QSL route for this one is unknown.
- **Ceuta Melilla**, the tiny Spanish colony in north west Africa, is still about for those who need this one. At 2158z I logged 1O6-AT-110 operated by Thomas on the band. Thomas was a good five by five. QSL route is via the P.O. Box in France.
- **Madeira Islands** are still with us on most longpath openings and at 2143z I noted a good five by eight signal from 119-AT-1O6 operated by Jose from Funchal. Jose had quite a pile up of stations at the time and was doing brisk business.
- Not much activity has been noted from **South Africa** with the strongest signal heard being from 44-AT-110 operated by Peter in the Transvaal region. At O559z Peter was a steady five by three.
- **Christmas Island** in the Indian Ocean was logged at O8O9z by way of the 217-AT-2O2, name unknown. He was trying to link up with a station in French Polynesia and was finding the going quite tough due to noise from south east Asia.

MIDDLE EAST & ARABIA

Although DXers in Western Australia seem to have the best pickings to this region signals have remained down on the eastern coast and in the Pacific.

- **Qatar** was noted at O43Oz by way of 115-QT-1O1 from Doha, the capital, operated by Ali. He had no shortage of takers to his calls and was a fair five by five.
- **Kuwait** has been about from time to time with the strongest signal coming from the 1O2-AT-1O2. At O953z Jamal was a steady five by two report and was busy with a pile up of Europeans.
- **Lebanon** is still around for those who need it. At O835z I heard Bassam, who operates as the 112-AT-149, coming through with a poor four by three report. Bassam lives in Beirut. Also from Lebanon I noted the 1-MAC-66, name unknown, and at O644z he was a reasonable five by four.

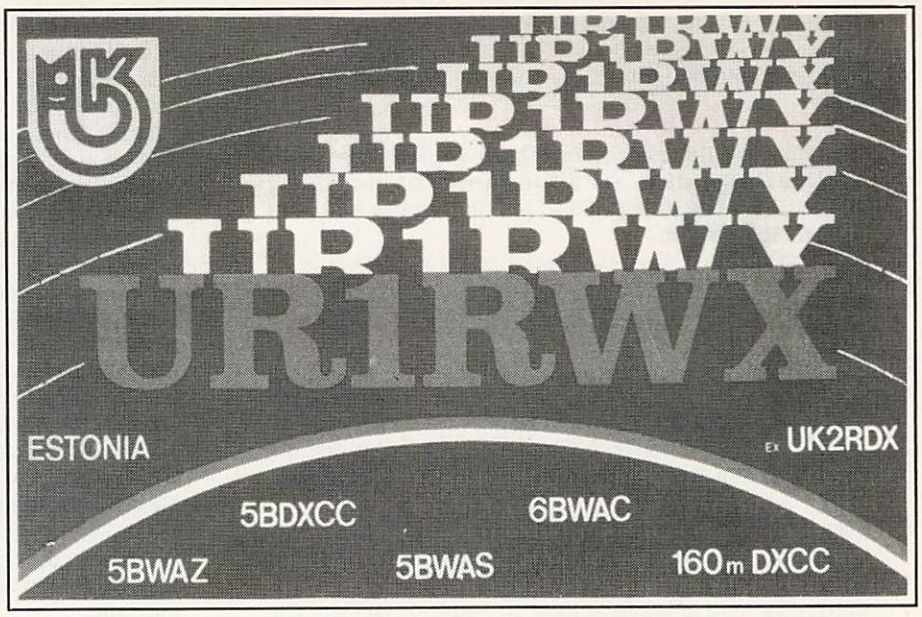
EUROPE

Aside from the usual rabble from this region there has been some good semi-rare DX about, providing you can hear it through the noise.

- **Albania** made a good solid appearance by way of Italian operator Serge, who was on the band signing as 1-AT-O68

portable 251. At 1311z Serge was a good five by six and peaked a nine at 1325z before the band dropped out. QSL via Serge's homecall.

- **Svalbard** was logged on the band at 12O2z by way of Einar, who signs as the 171-AT-1O1. He was a good five by four and was dealing with quite a large pile up of stations.
- **Aland Island** is about from time to time and at O741z I noted the presence of 212-AI-O1 on the band, name unknown. He was a good five by three and had no shortage of takers to the call.
- **Corsica Island** was logged at 115Oz by way of Jean, who signs as the 1O4-IC-1O3. Jean was a good five by six report and was looking for stations in New Caledonia.
- **Jersey Island** appeared on the band at 114Oz by way of John, who signs as the 167-WR-O1 and at the peak of propagation, around 1215z, he peaked a good five by nine plus 1ODB on the meter.
- **Poland** remains popular with DXers in the Pacific judging by the pile up I heard directed towards 161-AT-142 at 1O43z. He was a good five by six and later on at 1347z I noted a similar situation with 161-AT-159, who had his hands full. He was a good five by eight, peaking a nine at times.
- **Czechoslovakia** was logged at the rather late hour of 1426z by way of Rav, who signs as the 179-CZ-O2 from the city of Trebisov. Rav was a poor three by two as the band was on the way out.
- The republic of **Slovenia** has been getting quite a bit of "air-play" recently with a number of stations on air. The strongest I heard was at 1O46z coming from Oscar, who was signing as the 1-SLV-1O3.
  Oscar was five by six peaking eight. It remains to be seen as to whether these new republics, which were once Yugoslavia, will now receive DXCC status ect.
- **Balearic Islands** are always around when the band is open and at O838z I heard Pau, who signs as the 49-AT-124 on air and he was a solid five by nine at the time.
- Popular **Scandinavian** DXer, George, the coffee cup collector, was noted with his new callsign of 21-RS-O1 at 1OO1z. George was a five by five.
  It appears George has joined a few other prominent DXers disgruntled with AT and has thus gone his own way.
- Plenty of activity from **Eastern Europe** is about along with the European sector of the old USSR. On numerous occasions I have heard Mr Tom on air from the much controversial location of Estonia, signing as the 3O4-ES-1O1 as usual. Tom was a good five by seven here at O918z.
- **Latvia** was logged at 1146z by way of Victor, who signs as the 31O-SA-OO1 from the capital of Riga. Victor was a good five by five at the time and requests QSL cards go to his manager in France, the 14-AT-O49 with all the trimmings. Also from Latvia at O711z I logged the 310-PL-O3, name unknown, with a good five by six report.
- **White Russia** was noted on the band at 1413z with Serge, the 317-SA-OO1, leading the way with an impressive five by six report.
  Serge had quite a pile up on his hands despite the fact his transmitter was drifting up and down quite a bit, a common occurrence with a lot of eastern European stations.
- **European USSR** was logged by way of Rik, who signs as the 5O-IRO-O2, at O838z. Rik was a healthy five by eight report and was partaking in the IRO Radio Group contest. Rik requests all cards go via;
  P.O. Box 1284, SOCHI, 354OOO, USSR.
  With the added advice of NO CALLSIGN on the envelope.



This is the card from Tom (304-ES-101) from Estonia. Due to Tom's poor record in QSLing, this is a pretty rare sighting.

CENTRAL / SOUTH AMERICA & THE CARIBBEAN SEA

As usual the big signals from the South American continent are with us on a quite regular basis. The big guns from Central America have also been about. I would think most of us would well and truly have this region cleaned up in the QSL dept.

- **Grenada** was about the band by way of Jerry, who signs as the "5O2". At OOO3z Jerry was a fair five by two from this home at St Georges on Grenada.
- The **Cayman Islands** was about at O3O3z by way of CI-O22, name unknown.
- This station was a five by five report and was looking for stations in the Pacific region.
- **Cuba** was logged at O151z by way of Spanish speaking station UNIDAD-88 operated by Manuel, who was a good five by eight report although his modulation was not the best at times due to him having everything wound up.
- **Bermuda** has been coming through with some rather good signals in the past few weeks.
- At 2333z I logged the DX-6O8 at a good five by nine signal report, however, by O13Oz the band changed and his signal slipped to barely readable.
- The **British Virgin Islands** has been about by way of Worrell, who signs as the 128-AT-1O1. At O345z Worrell was a good five by seven here and had quite a large number of Australian stations chasing him for a new one.
- **Martinique** in the French West Indies has witnessed a burst of activity with two stations being heard in the same day. The first I noted was 136-FW-1O1, operated by

Claude, at O411z. He was a good five by six report and was soon joined by 136-AT-1O6 at O450z, who was not quite as strong managing only a five by two signal.

ASIA & THE PACIFIC REGION

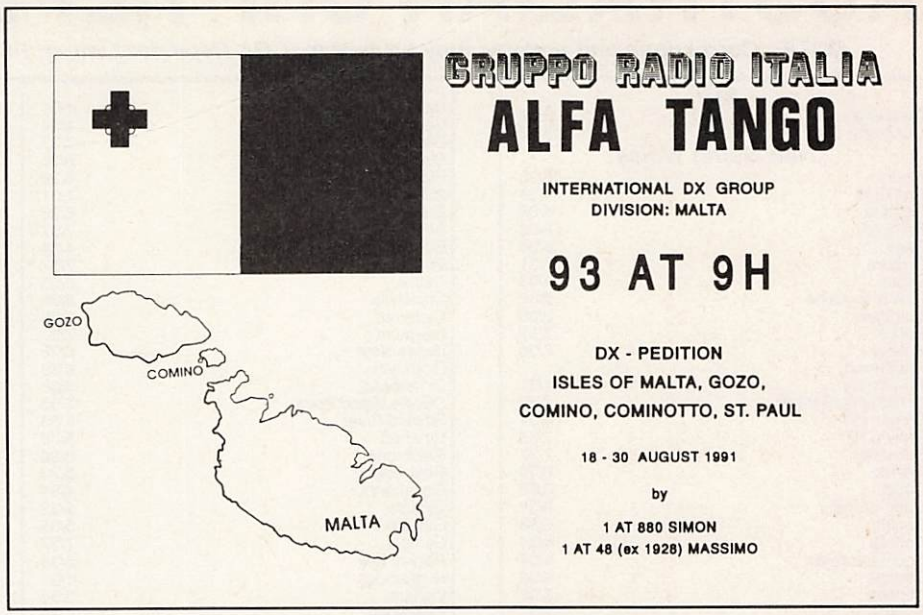
As one would expect our own region has been delivering quite an abundance of good DX throughout the daylight and evening hours and with good signals too.

- **Fiji** was logged at 2158z with the appearance of Willie, the UNIT-2O6 from Suva. Willie was five by seven and was looking for a mate in Kiribati.
- **Papua New Guinea** was about the band by way of Ron, who signs as the PNG-72O from the island of Rabaul. Ron was five by eight at O416z and was looking for a mate on a yacht in the Solomon Islands and thus was not interested in DX or DXers at the time. Ron also states he doesn't QSL at all.
- **Thursday Island,** in Australia's Torres Strait Islands, was heard at O13Oz with Alan the TIR-1 coming up on to the band. Alan was five by eight and was testing a new radio transceiver and antenna system he had just installed. It is not clear if Alan is interested in DX but I should think that Thursday Island should count for a few IOTA points.
- **Kosrae**, a small island in the Federated States of Micronesia, appeared on the band by way of Ken, the KR-1000 from Tafunsak District on Kosrae at O455z. Ken was a fair five by two report and was looking for a mate in nearby Pohnpei Island.
- **Western Kiribati** is still around for those who need this one and at the rather late hour for this region, O9OOz, I noted the T3CB-2215 on the band from South Tarawa. The station was a poor four by one at the time.
- Popular Christmas Island operator, Beriki, the 266-SR-1O1, is back on **South Tarawa** for a few months so there will not be much activity coming from Christmas Island in the next few weeks at least.
- **Hong Kong** has been given new prominence by the 60-FS-O1, operated by Janson, as he is on quite regular. Janson was a good five by seven report at 1356z and was doing quite well with his Kenwood TS-68OS and dipole antenna.
- **Mongolia** was logged at 16OOz by way of Tom the 95-AT-1O1, who was working a large pile up of DXers from around the world. Tom was a good steady five by five report and requests that cards go direct to him in Ulan Bator, Mongolia.
- **Galapagos Islands** often pop up on the band by way of Henry, who signs as the 145-AT-1O1, and at 2159z he was a poor but readable four by two report. Let's hope the signal picks up as there are still quite a lot of us who need this one.
- The **Asian Republics** of the once USSR are quite active and most of us should have just about cleaned most of them up as there is a wide variety of operators belonging to various DX groups on air.
- Although the QSL reputation of some leave alot of un-answered questions it is a case of work them now and worry later.

DXPEDITION NEWS

- ***Activities in this sector*** *remain rather quiet, and probably will remain so unless the band conditions pick up dramatically in the near future. However, there has been the odd one or two about to keep us entertained.*
- ***The Peoples Republic of China*** *appeared on the band over the period 16 and 17 January, signing as 2O3-SA-0 and at O955z was a good steady five by five report into Australia. QSL route is: P.O. Box 470, ULAN-BATOR, Mongolia-13.*
- ***Albania appeared*** *more or less on time via Italian DXer Serg, who operated as the 1-AT-O68/251 over the period 17 and 18 January. Quite a pile up ensured a lot of noise problems. At 1311z Serg was five by two here.*
- ***One DXpedition hard to fathom*** *was the 19-AT-PA operation on 30 January. At O9OOz the station was a fair five by three report and was in fact reported to be operating off some island in the Netherlands so I presume it would be good for some IOTA points. QSL route is via 19-AT-246.*
- ***Another DXpedition*** *which created quite a bit of confusion was the 14-AT-JO-92 operation over the period of 11 to 14 February. The "92" on the end of the suffix caused many to say the activation was from Libya, but judging by the size of the pile up, which was rather subdued, I think it would be more likely to be a special event station from France. Anyway cards go to: 14-AT-263.*
- ***QSL cards are filtering through*** *to those who worked the 93-AT-HB and 93-AT-HH operation from the islands of Malta last year. A total of five islands were activated for a total of 2825 contacts into 82 DXCC countries. As a nice gesture an envelope with a Maltese stamp cancelled in Malta accompanies the official QSL card as further proof to the operation taking place.*
- ***By now everyone*** *should be in receipt of their 2O7-AT-0 QSL card as the backlog has now been cleared. This DXpedition to Saint Martin Island created a world record 3OOO contacts to 1O1 DXCC countries.*
- ***QSL's are also coming through*** *for the following operations during 1991: 131-AT-0, 117-AT-0, 317-UR-0, and 251-AT-0. However a lot of DXers are still waiting for their 281-AT-0 cards from the Japanese operation on Ogasawara Island last year.*
- ***Fernando de Noronha Island,*** *off South America, should have appeared by the time you read this as 285-AT-0, scheduled for the end of February, although the dates were not too clear.*
- ***There is a rumor*** *that an Australian, or perhaps a combined Australian and New Zealand effort, may be off on a DXpedition to Lord Howe Island (268 prefix) and Norfolk Island (13O prefix) around mid 1992 depending on band conditions. No dates or operator particulars have been confirmed as yet.*

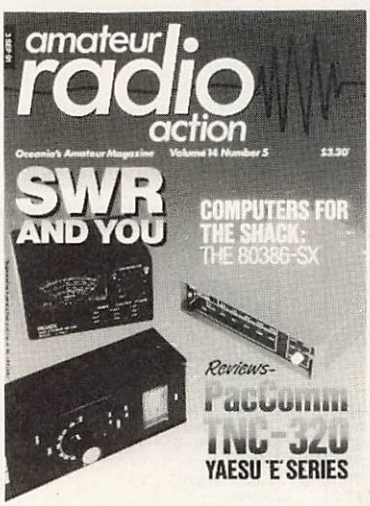
This is the official QSL confirming the five island operation from Malta during August of last year.



- **Kazakhstan** has been quite active recently by way of Alex, the 3O8-ON-1O1. At O855z Alex was a good five by nine plus and had quite a pile up.
- **Kirghizia** was well represented on the band by Vlad, who operates as the 3O9-NS-1O1, and at O850z Vlad was a readable five by two report here in the South Pacific region.
- **Azerbaijan** is always about the band and at O722z I logged the 3O3-AT-1O3 operated by Alex. He was a good five by six report and was chasing after the small islands in the Pacific region.
- **Tadzhikistan** seems to have the greatest number of stations active on the 11 meter band. In the course of one rather long evening at the radio I logged the following stations active on the band: 313-AT-1O2, 313-AT-1O1, 313-SL-86, 313-ON-1O2 and the 313-SU-1O3, all between the times of O650z through to 1344z with a variety of signal strengths observed.
- **Turkmenistan** was noted at the rather late hour of 1342z by way of Victor, who signs as the 314-AT-1O1. He was a good five by five report but soon faded out at the bands close around 14O5z.

Once again that is all I have for this issue, news is a little down due to the erratic band conditions and work commitment here.

Until next time - 73, Jack.



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AUSTRALIAN UHF REPEATER LIST

NOTE: Corrections and updates may be sent to: CBA Repeater Listing, PO Box E160, St James, NSW 2000.

ACT

Canberra	2/32
Canberra	8/38

New South Wales

Albury	6/36
Armidale	4/34
Barraba	6/36
Bathurst	8/38
Bega	6/36
Belbora	1/31
Binya	3/33
Blue Mountains	2/32
Bombala	8/38
Booral	7/37
Bowral	6/36
Braidwood	
Brewarrina	1/31
Brindabella Ranges	7/37
Broken Hill	4/34
Broken Hill	7/37
Buladelah	7/37
Casino	6/36
Cobar	8/38
Coffs Harbour	6/36
Coolah	6/36
Cooma	4/34
Coonabarabran	4/34
Corowa	2/32
Corowa	5/35
Corwa	7/37
Deepwater	5/35
Deniliquin	1/31
Dungog	3/33
Eden	2/32
Glen Innes	7/37
Grafton	8/38
Grenfell	1/31
Gundagai	7/37
Gunnedah	2/32
Guyra	1/31
Warden	1/31
Hampton	1/31
Hay	4/34
Inverell	2/32
Jindabyne	1/31
Junee	5/35
Kariong	8/38
Lismore	2/32
Manilla	3/33
Monkey Hill	6/36
Mt Lambie	2/32
Murrirundi	3/33
Muswellbrook	4/34
Narrabri	2/32
Narranderra	8/38
Narromine	5/35
Narromine	6/36
Newcastle	1/31
Newcastle	2/32
Newcastle	5/35
Newcastle	6/36
Nundle	7/37
Orange	3/33
Port Macquarie	2/32
Sydney	5/35
Sydney (south)	1/31
Sydney (west)	3/33
Sydney (outer-west)	4/34
Sydney (north)	7/37
Tamworth	4/34
Tenterfield	3/33
Tumbarumba	3/33
Tumut	6/36
Tweeds Heads	4/34
Wagga Wagga	1/31
Wagga Wagga	5/35
Walbundrie	2/32
Walcha	2/32
Walcha	6/36
Walcha	8/38
Warrumbungles	1/31
Wingham	1/31
Wilcannia	1/31
Wollongong	8/38
Northern Territory	
Bushy Park	1/31
Darwin	1/31
Erldunda Station	3/33
Katherine	2/32
Maryvale Station	4/34
Mt Swan	2/32

Queensland

Alpha	2/32
Atherton	8/38
Amiens	8/38
Ayr	3/33
Barcaldine Downs	1/31
Bathurst Heads	1/31
Bauhina Downs	4/34
Biloela	7/37
Blackall	8/38
Blackwater	6/36
Brisbane	1/31
Brisbane	5/35
Brisbane	7/37
Bundaberg	4/34
Bundaberg	7/37
Cairns	3/33
Chinchilla	8/38
Clermont	6/36
Clermont	7/37
Crows Nest	6/36
Dimbulah	6/36
Dirranbandi	8/38
Double Island Point	3/33
Edward River	3/33
Emerald	8/38
Gladstone	6/36
Gold Coast	3/33
Goondiwindi	4/34
Gympie	2/32
Gympie	5/35
Gympie	7/37
Hervey Bay	8/38
Hughenden	1/31
Ingham	2/32
Inglewood	1/31
Innisfail	1/31
Ipswich	4/34
Jericho	4/34
Kilcoy	3/33
Lakeland Downs	2/32
Longreach	3/33
Mackay	3/33
Mackay	6/36
Marlborough	2/32
Maryborough	6/36
Maxwelton	2/32
Miles	6/36
Monto	3/33
Moranbah	4/34
Moura	1/31
Mt Isa	1/31
Mundubbera	6/36
Murgon	7/37
Quilpie	2/32
Rockhampton	1/31
Rockhampton	4/34
Roma	1/31
Springsure	3/33
Sunshine Coast	6/36
Sunshine Coast	8/38
Tambo	6/36
Taroom	2/32
Thargomindah	6/36
Toowoomba	2/32
Toowoomba	4/34
Townsville	1/31
Townsville	4/34
Wavell Heights	2/32
Warwick	1/31
Wide Bay	1/31
Yaraka	7/37

South Australia

Adelaide	5/35
Angaston	4/34
Blinman	3/33
Carrietown	1/31
Ceduna	1/31
Clare	7/37
Cleve	2/32
Coonalpyn	6/36
Coppudurba Hill	1/31
Hawker	7/37
Kangaroo Island	4/34
Manum	8/38
Mt Bryan	8/38
Mt Gambier	5/35
Mt Gambier	7/37
Myponga	2/32
Naracoorte	4/34
Orroroo	2/32
Port Lincoln	8/38
Port Pirie	4/34
Renmark	6/36
Snowtown	6/36
Tarcoola	6/36
Wilkatana	8/38
Yorketown	7/37

Tasmania

Burnie	8/38
Central Highlands	7/37
Devonport	1/31
East Coast	6/36
Flinders Island	1/31
Hobart	1/31
Hobart	5/35
Launceston	2/32
Launceston	6/36
Midlands	4/34
North East Coast	3/33
North West Coast	4/34
North West Coast	6/36
Sandfly	2/32
West Coast	2/32

Victoria

Alexandra	1/31
Ballarat	2/32
Ballarat	5/35
Bairnsdale	7/37
Beech Forest	3/33
Bendigo	4/34
Cavendish	8/38
Currajung	4/34
Echuca	6/36
Euroa	3/33
Falls Creek	3/33
Foster	6/36
Geelong	4/34
Halls Gap	6/36
Hamilton	5/35
Harcourt	8/38
Hawkesdale	4/34
Horsham	3/33
Kerang	2/32
Lavington	4/34
Mansfield	2/32
Melbourne (north)	1/31
Melbourne (metro)	3/33
Melbourne (metro)	5/35
Melbourne (south)	7/37
Mildura	3/33
Moe	2/32
Mornington Pen.	8/38
Mortlake	7/37
Mt Cann	8/38
Mt Concord	6/36
Mt Delegate	3/33
Mt Terrible	8/38
Myrtleford	8/38
Penshurst	1/31
Shepparton	7/37
St Arnaud	1/31
Swifts Creek	1/31
Talangatta	7/37
Wangarrata	6/36
Waubra	7/37

West Australia

Albany	3/33
Augusta	7/37
Bencubin	2/32
Boyup Brook	4/34
Bunbury	2/32
Carnamah	2/32
Carnarvon	2/32
Coolgardie	7/37
Darkin	6/36
Denmark	1/31
Esperance	4/34
Kalgoorlie	2/32
Kambalda	1/31
Katanning	1/31
Kellerberrin	1/31
Kulin	4/34
Lancelin	4/34
Mandurah	7/37
Manjimup	6/36
Margaret River	6/36
Meekatharra	1/31
Merredin	2/32
Mia Mia	1/31
Mt Manypeaks	6/36
Mt Barker	5/35
Mt Barrow	7/37
Mt Saddleback	1/31
Mt Solus	4/34
Nannup	2/32
Perth	1/31
Perth	3/33
Perth	5/35
Perth	8/38
Ravensthorpe	8/38
Stirling Ranges	7/37
Wickham	1/31
Wongan Hills	8/38
Wyalkatchem	6/36
York	7/37

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■ Front Panel Field Programmable in 2 Modes
—**Group Scanning**
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■ Memory Protection Circuit
■ Hi Intensity L.E.D. Display with Dimmer Control
■ Sel-Call Option

TX475S 40 CHANNEL HANDHELD

NOW WITH SEL-CALL OPTION

Small, rugged and super reliable.

NEW LOW PRICE

ACCESSORIES

BUYING A BASE STATION? You'll need the following GME accessories:

■ A TX821/826/830 or a TX840A AM/SSB transceiver ■ PSA123 RV power supply ■ LE50-3 10 metre co-axial base lead ■ AE228 27 MHz base aerial ■ MB410 base aerial mounting hardware.

GETTING READY TO PUT IN A UHF BASE? Here are the GME products you'll need:

■ A TX472S transceiver ■ PSA123 12V power supply
■ LE50-3 10 metre co-axial base antenna lead
■ AE420 base antenna, (10dB and 12dB also available)
■ MB410 base aerial mounting hardware.

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